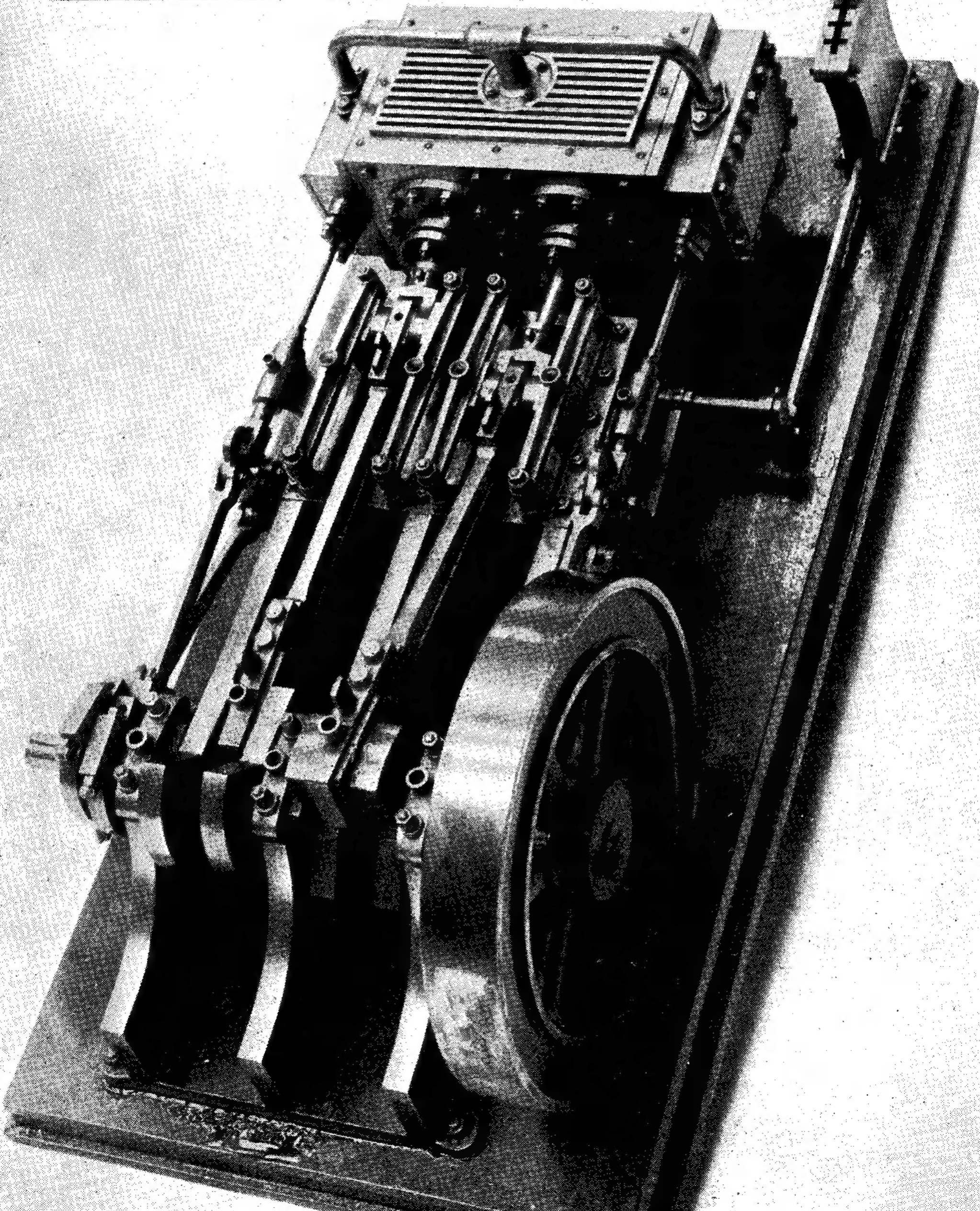
THE MODEL ENGINEER



Vol. 103 No. 2572 THURSD[illegible]T 7 1950 9d.

The MODEL ENGINEER

PERCIVAL MARSHALL & CO. LTD., 23, GREAT QUEEN ST., LONDON, W.C.2

7TH SEPTEMBER 1950 VOL. 103 NO. 2572

SMOKE RINGS

Our Cover Picture

● MODELS OF stationary steam engines are always popular in the competition section of the "M.E." Exhibition, and this year was no exception to the rule, though generally speaking, the models entered on this occasion did not reach the standard of elaboration or complexity which has been seen in some of the previous Exhibitions. This is not, however, an implication that they were inferior in the quality of workmanship or fidelity of character. The model illustrated was one of the most interesting in this class ; it was constructed by Mr. J. W. Ayres, of Stockton-on-Tees, and is described as a "Free-lance Two-cylinder Reversing Mill Engine." A description of the engine, with a photograph, has already appeared in our issue of August 24th. It is fitted with Stephenson link motion, controlled by a quadrant lever as in most types of locomotives. Without questioning the correctness of equipping the engine with reversing gear, the reason for fitting it to a mill engine (as distinct from a winding, hauling or rolling engine) is not quite clear, and we cannot recall an instance of such gear being fitted in any full-sized mill engine with which we are personally familiar.

On Time

● WE HAVE lately received several complaints from readers who state that THE MODEL ENGINEER is often very late in being delivered, and enquiries usually bring the information that it arrives late from the printers. We cannot offer any explanation as to what may be the source of this information, but we would like to take this opportunity of assuring all readers that, at no time since the dreadful winter of 1947, has THE MODEL ENGINEER been late in being sent out from our works ; so far as we are concerned, there is no reason why every reader in the British Isles should not receive his copy every Thursday, no matter from what source he obtains it. It is our proud boast that, even in the most difficult conditions, THE MODEL ENGINEER has usually been on time, and we take all possible steps to guard this record. In 1940, when an enemy bomb destroyed our London offices and all the copy for a whole week's issue, we were about two days late that week ; in 1944 when another enemy bomb nearly wrecked our works and destroyed quite a lot more "copy," we lost one day, and once or twice during the winter of 1947, when power cuts rendered cur printing presses idle for hours on end, we came

out two weeks late. But apart from these accidents, the "M.E." should always be on your doorstep on the date of publication.

A New Boat by an Old Champion

● ONE OF the first of our overseas readers to visit the Exhibition was Monsieur G. M. Suzor, of Paris, who needs no introduction to those of the model making fraternity who "go down to the pond with boats." M. Suzor brought over with him his latest "C" class boat, *Sylla V*, which is fitted with the same engine as that in the original *Madamoiselle Sylla*, which was the first of his post-war boats to be seen in this country. A rather interesting point about the new hull is that it appears to dispense with many of the features which modern designers usually consider to be indispensable, and the hull itself is extremely small for the amount of power applied to it, particularly in respect of the beam, which is less than 6 in. and constant from stem to stern. M. Suzor brought over this boat to take part in the International Regatta held at Derby on Saturday and Sunday, August 12th and 13th. Our photograph, taken at the Model Power Boat Association stand, shows M. Suzor discussing *Sylla V* with Mrs. E. W. Vanner and Mr. E. T. Westbury.

Southport's Third Exhibition

● THE THIRD annual exhibition organised by the Southport Model and Engineering Club will be held in the Cambridge and Victoria Halls, Southport, from October 28th until November 4th next, Sunday excepted. The show will be opened at 1 p.m. on the first day and at 11 a.m. on other days. Models of all kinds will be displayed; they will be divided into six main sections, each of which will be sub-divided as necessary to cover the very comprehensive range.

Entry forms and any other information can be obtained from the hon. secretary, Mr. T. Nelson, 41, Hawkshead Street, Southport, Lancs. Meanwhile, we extend out good wishes to the venture, and we hope that it will be at least as successful as the two previous exhibitions.

Success at Last

● MR. I. W. MARSH, of Barry Dock, whose magnificent model of the clipper ship *Thermopylae* won the Championship Cup in its class at the "M.E." Exhibition this year, is an outstanding example of the truth of the adage that "perseverance always conquers." He has been trying hard, over a period of *twenty-six years*, to win that coveted cup! And now, at long last, he has got it. His model is certainly a splendid example of careful observation translated into extremely accurate miniature detail work which fully merited the prize it won. We congratulate Mr. Marsh heartily upon his success, his patience and unfailing faith in his own abilities.

Model Aircraft at the Exhibition

● A NOTEWORTHY feature of the model aircraft section at this year's "M.E." Exhibition was the increase in both the quality and quantity of the entries. Aircraft powered by i.c. engines predominated and, in fact, only two rubber-driven models were entered. The trend towards radio-controlled and flying scale model aircraft was clearly evident and many fine examples of craftsmanship were to be seen.

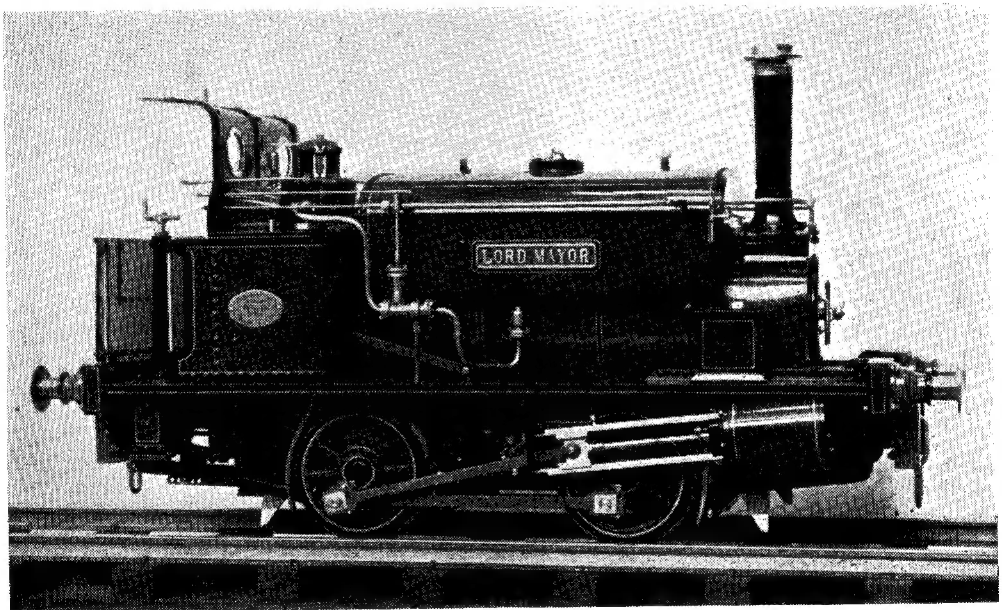
The October issue of our monthly contemporary *Model Aircraft*, which will be on sale on September 20th, price 1s. 6d., will contain a fully illustrated review of the competition and trade exhibits in this section.

"M.E." Exhibition, 1950

The Steam Locomotives

by J. N. Maskelyne, A.I.Loco.E.

OF the twenty-one entries in the competition this year, nine were of sufficient merit to win awards. At first sight, this might suggest that the general standard of excellence was low; but, in an exacting competition of this nature, the judges have to be really merciless and award the prizes only to those exhibits which are outstanding on all counts. A very small number of this year's competitors would fail to win an award in a less keen competition. Readers may like to know that, as an indication of the keenness of the contest, the difference between the highest and lowest totals of points gained by the winners in this year's Locomotive section was 90, making it one of the closest contests that I have ever known.



P. J. Dupen's 5-in. gauge saddle-tank locomotive. One of the purest gems that have ever been seen at the "M.E." Exhibition

I am not going to say much here about the Championship Cup winner, Mr. P. J. Dupen's glorious little 5-in. gauge 0-6-0 saddle-tank, *Lord Mayor*; for I want Mr. Dupen to tell us his own story about it, in a future issue of the "M.E." My only comment, for the moment, is that this diminutive locomotive is one of the purest gems of its kind that has ever come to my notice in the forty-odd years that I have been associated with the hobby.

Dr. F. W. Hebblethwaite's beautiful 3½-in. gauge G.N.R. Stirling 8-ft. singlewheeler won a Silver Medal and thoroughly deserved it. The cab was its only blemish, by being too deep, and the plate of which it was made was not quite flat, causing an uneven surface on each side and a disfiguring downward and rearward slope of the roof. These faults can be easily corrected, though probably the best method would be to make a new cab; then this engine would be well-nigh perfect.

Mr. C. G. East's 2½-in. gauge L.M.S. 4-6-2 *Princess Royal* and Mr. A. A. Sherwood's remarkable "OO"-gauge, steam-driven 2-10-10-2 Mallet four-cylinder compound locomotive each won a Bronze Medal. In both cases, the workmanship was the outstanding feature, though in rather different ways. Mr. East's was clean, neat and precise, especially with regard to the riveting and fitting, while the general finish was of a very high order. Mr. Sherwood's was a near-miracle in miniature construction, as might well be expected from one who, as our readers who remember the "Dot" series of tiny steam boat engines will need no reminding, has specialised in this kind of thing. Spectacular? It may be; but that does not detract from the credit due to Mr. Sherwood for having produced a successful working ultra-

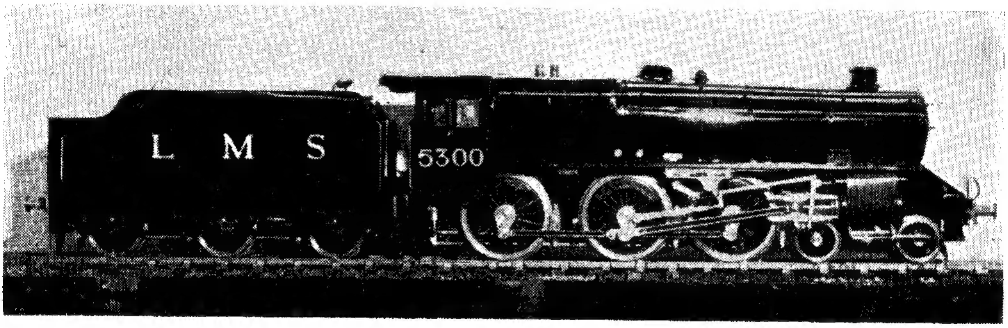
miniature locomotive, coal-fired at that! *And* it is very close to true-scale dimensions, in spite of its very small size.

Mr. E. Allen's 2½-in. gauge G.W.R. "Bulldog" Class 4-4-0 is an astonishing piece of work. In outline and general proportions it is very, very true to type; yet it is not exactly like any "Bulldog" that ever ran on the G.W.R., which is remarkable in view of that fact that there were no fewer than 156 of these engines! The explanation is that Mr. Allen has occupied spare time over a period of 20 years in constructing his model, and every detail on it has been taken and carefully scaled down from a prototype engine, whenever he could find one of them at his local running-shed (Reading). During that time, the "Bulldogs" have undergone numerous and frequent subtle variations of detail, which, however, did not all apply to every engine in the class. The result is that Mr. Allen has got a mixture of these variations which, as a whole, never applied to a full-size engine. That he is, himself, cognizant of this fact probably explains the fictitious name on his engine. All the same, this interesting and pleasing piece of work scored high enough to gain an H.C. certificate.

Mr. J. Knighton's 3½-in. gauge 4-6-0 *Doris*, built to the ever-popular "words and music" of the one and only "L.B.S.C.", is a fine job, the fitting and finish of which make one wish that *all* the *Dorises* built and building could be of the same quality as this one. The awards in this case were an H.C. certificate and the Michael C. Bradbrook Prize for the best 3½-in. gauge, coal-fired, passenger-hauling locomotive, and both were well deserved.

Mr. A. Bielby's 3½-in. gauge 0-4-0 tank locomotive, *Shortie*, won the "Wilwau" Prize. This little engine is really a "Juliet," built strictly to "L.B.S.C.'s" published instructions, by a farm worker who has never had any mechanical training. He obviously has a flair for neat, careful work, and an eye for good form and proportions. All the platework was beautifully flat, the pipe-work clean and trim, and the fitting everywhere was good. The prize he has won is a complete set of castings for *Pamela*, and we look forward to seeing the result of his work on them.

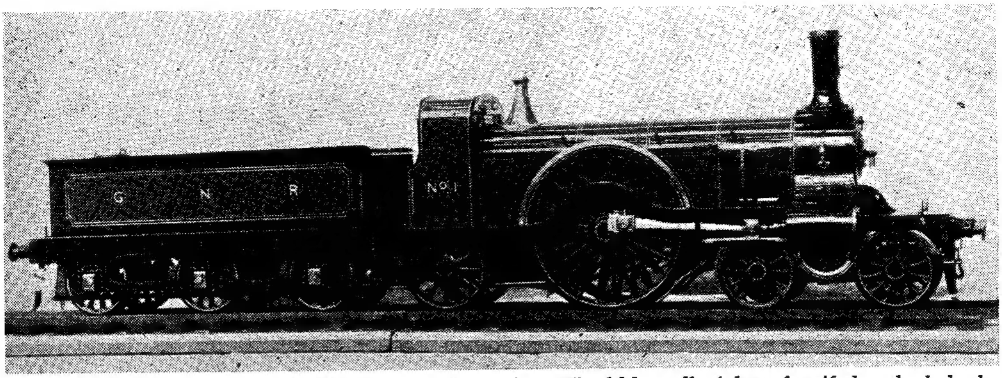
Mr. C. R. Jeffries won the Fylde Pre-group Locomotive Prize for the best 5-in. gauge locomotive built by an amateur and painted in correct pre-grouping colours. His engine is an "87XX" G.W.R. pannier-tank, not *strictly* a pre-grouping class, but a later variant of the original "57XX" class, some hundreds of which were built before and after the grouping of the railways. The model is painted in the correct pre-group livery and, therefore, qualified for the prize; its only error is a copper cap on the tapered chimney, surprising in view of the fact that the model, in other respects, so closely follows the prototype. The points it gained in the competition were only just short of the total required for an award. The workmanship was absolutely first-class, and I am entirely in agreement with certain departures from the prototype, made in the interests of successful working when running on a track; but there were other more or less minor alterations which had been made for no apparent or desirable reason and had the effect of inflaming the ruthlessness of the judges!



J. Knighton's fine 3½-in. gauge "Doris," with some pleasing refinements and excellent finish combined with carefully reduced prototype proportions

Mr. E. M. Thomas's 3½-in. gauge L.N.E.R. 2-8-0 + 0-8-2 Garratt locomotive was awarded the A. J. Reeves Prize. It is a fine piece of work displaying very good craftsmanship; but, from almost every point of view, it seemed to be unnecessarily massive. The impression it gave, no matter under which heading it was being judged, was that the builder had set out deliberately to construct the "biggest ever" locomotive on 3½-in. gauge. If this *is* his ambition, I would suggest that his chances of success would be considerably enhanced if he chose one of the South African Garratts, which are larger than any steam locomotive yet built for British railways; built to 1-in. scale for 3½-in. gauge, and as closely as possible to scale, the result would be what our friend "L.B.S.C." so aptly describes as a "Bill Massive" job.

No other awards were made, for the simple reason that no other entry gained the percentage of marks necessary to win an award. Lt.-Col. L. Billinton's 2-in. scale replica of one of his own 2-6-0 express goods locomotives aroused much interest, chiefly on account of its size and because it is the first instance of a miniature steam locomotive built by a locomotive engineer who was



T. C. Horne's 5-in. gauge G.N.R. 8-ft. singlewheeler. Would be well-nigh perfect if the wheels had better tyres and spokes

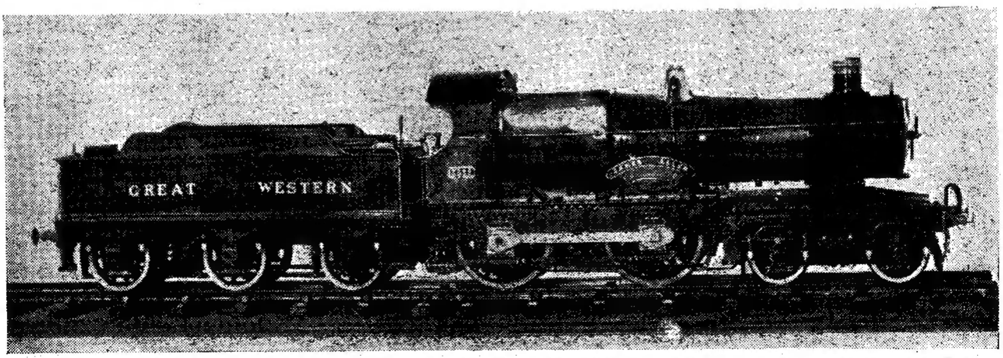
himself responsible for the design and construction of the prototype. Under the headings of workmanship and fidelity, it did not score very high marks, by the standards that had been set, and it just failed to gain an award. The quantity of work in it, however, is prodigious, and I hope to publish some photographs and an account of its construction, since Col. Billinton has been kind enough to send me a large number of photographs taken at various progressive stages during the building of this most interesting engine.

Mr. S. T. Harris's 5-in. gauge 2-6-4 tank engine, coming from a former cup-winner, was, to say the least, a bitter disappointment. The workmanship and finish, however, defied criticism and aroused the utmost admiration ; but the grotesque distortion in every feature was, to be quite frank, positively revolting. Grant that it was not a scale reduction of the Stanier design, and that it was intended to be a freelance job, there is still no justification for its being grossly out of proportion, mechanically as well as aesthetically, in every detail. It is this kind of thing which does so much damage to the reputation of the model locomotive fraternity in the eyes of the locomotive engineering profession.

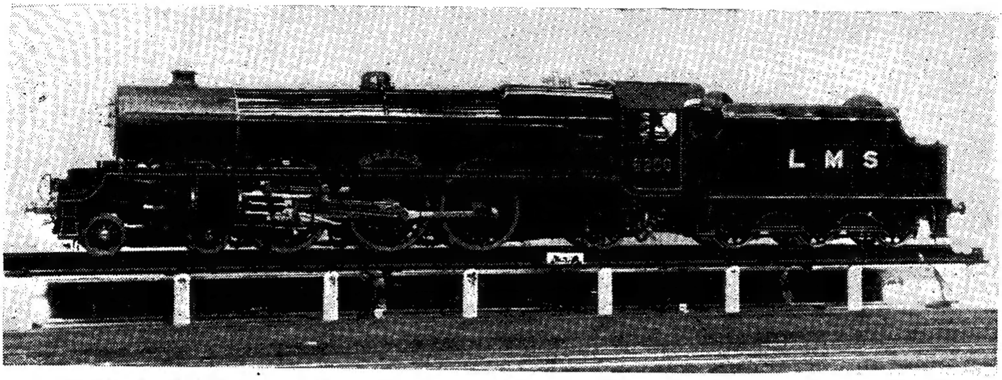
Mr. E. J. Morris's ¾-in. scale L.M.S. Fowler 2-6-4 tank engine, on the other hand, was a gem by comparison. If his workmanship had been up to Mr. Harris's standard, he would have qualified for a high award. His engine wants a much better chimney ; he may dislike the original Fowler chimney and he may have intended to reproduce one of the Stanier pattern which most of the full-size engines have now acquired, but his is a long way from being right.

Mr. T. C. Horne's 5-in. gauge G.N.R. Stirling 8-ft. singlewheeler, at first glance, is a fine job ; but it has gone wrong in a number of prominent details. The wheels are particularly bad in not having sufficient thickness in the tyres, in having rounded instead of rectangular spokes, and in having extremely clumsy flarings where the spokes merge into the rims. The cab windows are too small, and certain details in the painting are not correct. This is a pity, because, in other respects, the model is a most excellent reproduction of the lovely full-size engine as built in 1870 ; even the old type of tender is very well reproduced, and all the old high quality of finish is well rendered in this interesting job. I would like to turn down the rims of those wheels just a trifle more, removing the flanges, of course, and then fit good steel tyres ; it could make a wonderful improvement.

Mr. F. Law's 2½-in. gauge *Dyak* 2-6-0 locomotive provided something of a novelty in being mounted on a test-stand built to par-



E. Allen's 2½-in. gauge G.W.R. " Bulldog." Not quite like any of the numerous prototypes, but nevertheless " Swindon " from top to bottom and from end to end



C. G. East's 2½-in. gauge L.M.S. " Princess Royal." A beautifully finished job, but contained some easily avoidable errors

ticulars given in the " M.E." by Mr. W. Shellshear about twelve months ago. This exhibit should really be seen working, if full justice is to be done to it ; its main objects, however, could be understood fairly readily upon examination.

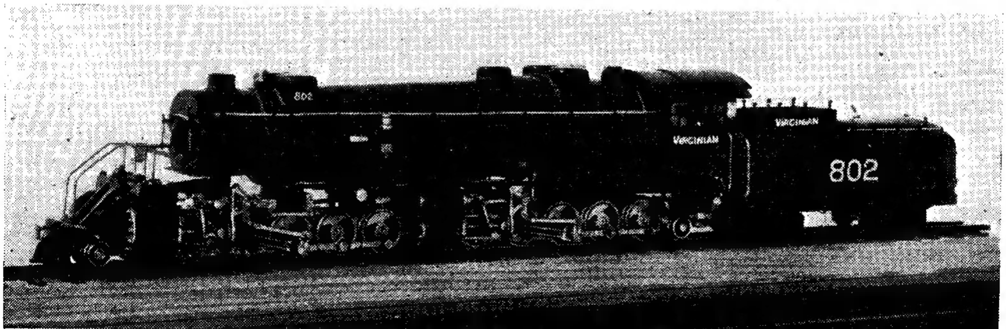
Mr. J. E. Jane's 1¾-in. gauge *Juliet* with oscillating cylinders attracted attention on account of its being constructed out of all manner of odds and ends. As a first attempt at locomotive building, it commands some respect, and it should serve as a kind of stepping-stone to better things in the future. The open coal wagon which goes with it is very fully detailed and is obviously the result of observation ; but the main proportions could be a lot better than they are, even allowing for the fact that, here again, all sorts of odd pieces of wood and other material were pressed into service.

Mr. W. Jones's 0-4-0 tank *Liverpool*, for 5-in. gauge is another example of a small engine for this popular gauge, compact, easily transportable and, I should imagine, very serviceable on the track. Its proportions are not unpleasing—certainly not revolting—but I would like to see a little more detail on it, to relieve the impression of bareness which it gives, at present.

Mr. J. W. Powell's *Rainhill* is quite a nice example of this popular engine, and seems to have been built exactly according to " L.B.S.C.'s " instructions.

Before I finish with the competition entries, I must mention three scarcely-half-finished locomotives, one an S.R. " Schools " class 4-4-0 by Mr. F. Woodcock, the second a Pacific by Mr. G. Pilling, and the third a tank locomotive by Mr. B. Cawdron. All three are for 3½-in. gauge and show good work ; but none is in a sufficiently advanced stage to be placed in open competition with completed exhibits. For this reason, they could not be judged ; it is a mistake to enter an unfinished model of any sort in an open national competition, because, if an award is gained by it, the model is automatically barred from being entered again when it is finished.

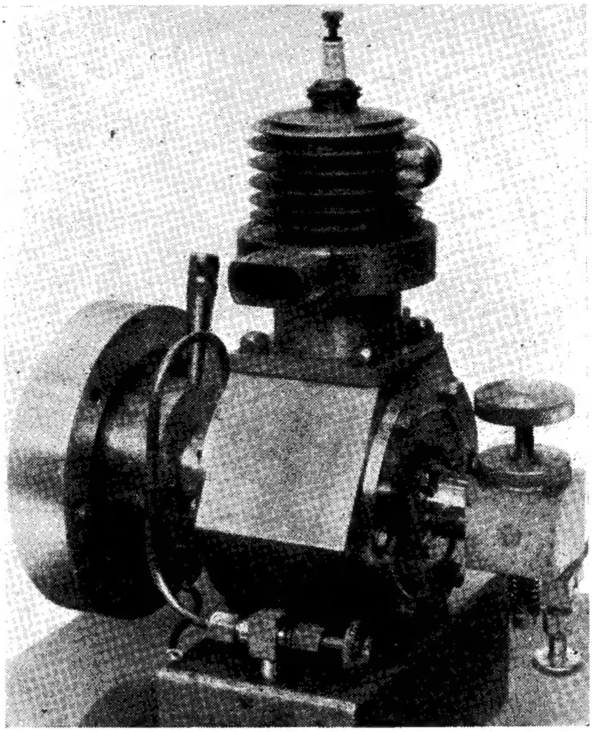
Finally, a 1¾-in. gauge, unpainted *Juliet* by Mr. C. F. Toms is a severely simple, but neat little job which looks as if it could give a good account of itself when in steam on a track. Its proportions are quite good and its construction appears to be sound ; no doubt, the experience gained from the building of this little engine will serve Mr. Toms in good stead when he builds another engine. At any rate, I hope to see some more of his work which, at present, is full of promise.



A. A. Sherwood's remarkable four-cylinder Mallet compound locomotive for 16.5 mm. gauge. It has a coal-fired boiler and functions properly as a compound, though considerable adjustment of the steam supply was required before it would do so

I.C. Engines at the "M.E." Exhibition

ONCE again, the exhibits in this section are few in number, and it is a perpetual source of wonder what becomes of the innumerable engines which are furtively shown, in the course of construction, at the pond side, and at many a club meeting, all over the country. Either the constructors are too modest to enter them in the "M.E." Exhibition, or they never get completed. However, what the exhibits lack in numbers they make up for in variety; and also in quality, while, in more than one case, considerable ingenuity is shown either in the design as a whole, or in details and arrangement. It is gratifying to note that practical interest is being taken in engines of other types than those intended for pure utility, and it is significant that out of eight competition exhibits, no less than four are of the four-cylinder type—two four-strokes and two-two-strokes—proof positive of the rapidly increasing popularity of the multi-cylinder engine. The constructors of these engines are to be commended for their enterprise in facing the extra work entailed in the many working parts, as compared to the simple, and occasionally crude, "utility" single-cylinder engine, and it is clear that the internal combustion engine is now recognised as being just as worthy an object for the talent of the serious model engineer as other types of mechanical models, quite apart from its use or application, which has often been the only incentive to construction in the past.



The experimental engine by C. H. Toogood, of Sudbury

Of the simpler types of engines, the "Atom Minor" Mark III by R. Sadd, of Chelsea, represents a fairly conscientious effort on a type of engine which has rather been neglected by constructors, despite the fact that its design and constructional processes were specially intended to appeal to them. The accuracy and finish on this specimen appear to be quite good, and it should work quite well, but there are some grounds for criticism of the castings used, though this is, presumably, outside the control of the particular constructor. Within the last few years, the "M.E." has campaigned vigorously for the improvement of castings for small petrol engines and other types of models, and certain sections of the model trade have supported this movement, but others, unfortunately, are still lagging behind.

No castings at all are used in the experimental engine by C. H. Toogood, of Sudbury, who is a veteran in this particular field, and may be remembered for his attempts to produce small injection type compression-ignition engines before the war. The components of this engine are either machined from the solid or fabricated by the brazing, a conspicuous feature being the hexagonal steel crankcase. It is stated that the engine was built for the purpose of experiments in the improvement of cylinder and port design, though the nature of these is not obvious from external inspection of the engine. The carburettor is of the mixing-valve type with a spring-loaded valve, the lift of which can be controlled by a screw acting as a throttle valve. While there is much to be said for the methods of construction used in this engine, where the object is either sheer utility, or experiments which may possibly involve considerable alteration of the structure, it is not to be commended from the aesthetic aspect, and the appearance of such an engine is rather against it in an exhibition. This does not, however, imply that machining from the solid, or fabrication, are unsuitable methods for producing shapely or handsome models; on

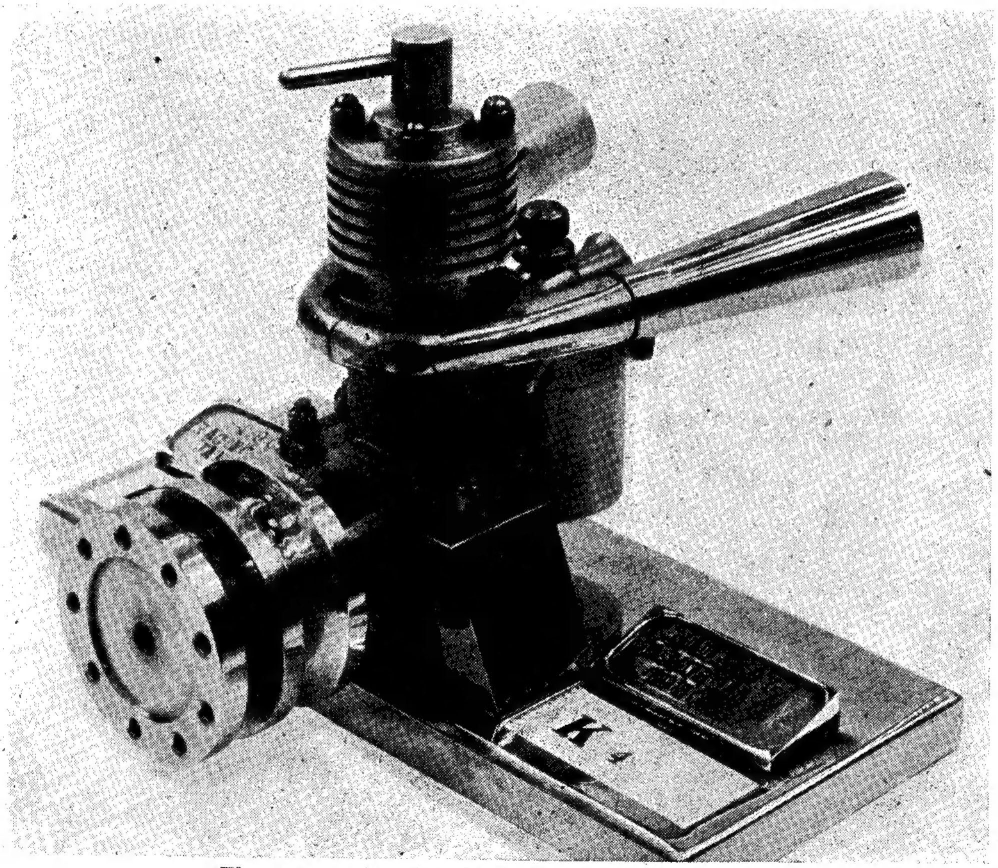
the contrary, they can be, and often are, employed to produce shapes just as finely sculptured as those of well-designed castings, though this usually involves complex machining or fitting operations.

The 4.9 c.c. compression-ignition engine by G. Morgan, of Port Talbot (described in the catalogue as an "experimental racing diesel") is quite a well-made and finished example of a type of engine which is very popular nowadays, though less suited to construction by the amateur worker than to commercial production. Despite its descriptive title, it does not present any very obvious characteristics of its own, with the exception of the huge "megaphone" exhaust pipes, which tend to dwarf the engine itself; but it is rather a change, and a welcome one, to see any attempt at all made to convey or direct the exhaust gases in an engine of this type.

Good workmanship and finish have also been put into the example of the 10 c.c. "Ensign" engine, made by B. A. Lewis, of Beckenham.

The popular "Seal" four-cylinder engine design has inspired two competitors in this section, namely A. B. Langley, of Sheffield, and A. L. King, of Hull, though the latter has enlarged the design to twice its normal linear dimensions, producing an engine of 120 c.c., which is larger than is likely to be required for driving any normal type of model, with the possible exception of a locomotive of 1½ in. scale or upwards. It would, however, be quite an attractive power unit for a small motor dinghy, or even a light motor cycle. The design of the original 15 c.c. "Seal" seems to have been followed fairly closely in the larger scale, but a different type of carburettor is fitted, having float feed, and apparently working on the same principle as the "Atom" type R or Mark IV, though arranged vertically instead of horizontally.

It was, of course, necessary for the constructor to make special patterns for the enlarged engine and these are by no means the least interesting part of the exhibit; it is hoped that many readers who continually ask for castings differing in size or detail from those normally available, will be inspired to "go and do likewise." But Mr. King did not stop at making the patterns; he produced the castings as well, using the facilities of the domestic kitchen range as a melting furnace. Whatever may be the merits



The 4.9 c.c. racing c.i. engine by G. Morgan, of Port Talbot

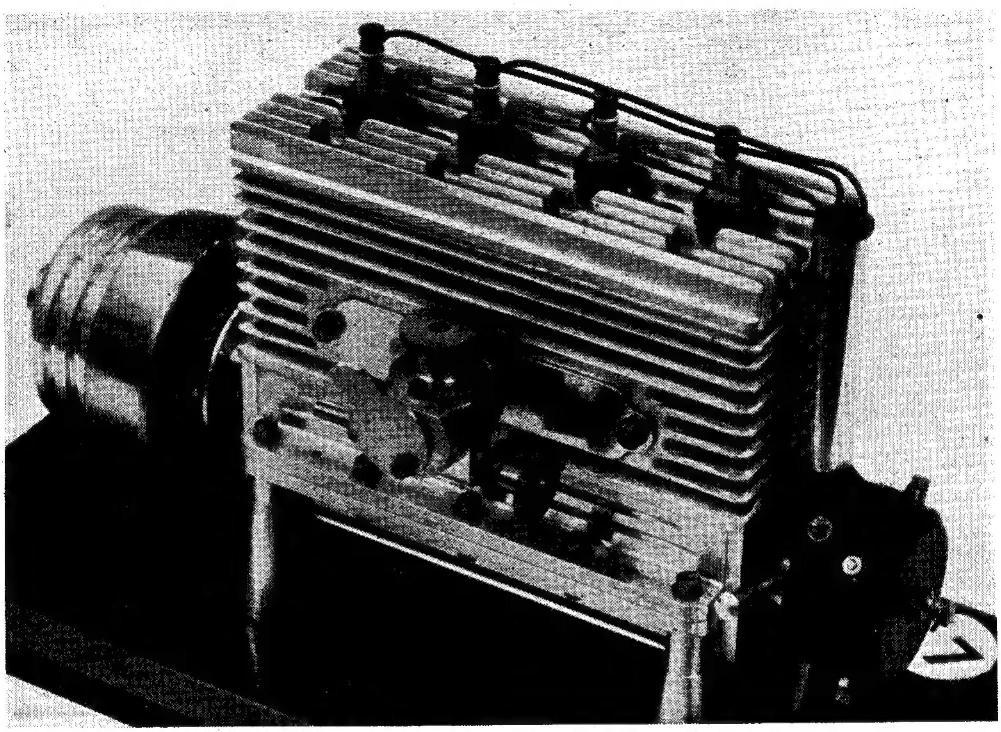
of this exhibit as a model, or even a working engine, it certainly deserves every commendation as an example of enterprise and perseverance.

Mr. Langley's "Seal" is of the normal size, and apparently made from a standard set of castings. It includes all the various accessories normally required for a complete installation, including ignition equipment, fuel tank, and cooling water tank, all of which are neatly arranged on the engine baseplate. One point worthy of note is that the constructor has made a fuel tank which really looks like one, instead of looking like what it very often is, a discarded tin can, or a very hastily-made and shapeless coppersmith's nightmare. This engine, again, is a specimen of good all-round workmanship, and if its appearance does not belie its performance, should work very satisfactorily.

One of the most interesting and original exhibits in this section, or indeed in the whole of the mechanical section, is the 10 c.c. four-cylinder two-stroke by F. Boler, of Leatherhead, which has been produced to do duty as the power unit of a model car yet to be built—incidentally, an indication of the trend of thought among the more zealous devotees of the model car cult. Mr. Boler has previously won distinction, not only in model car racing, but also in the 1948 "M.E." Exhibition, where his "M.C.N. Special," with 10 c.c. "Ensign" engine, won the "M.C.N." award. His present venture, therefore, is backed by a good deal of solid experience, both in the construction and running of model racing car engines.

The multi-cylinder two-stroke, though much simpler in mechanical detail than its four-stroke counterpart (the comparative complexity of the two types is generally in the same proportion, whatever the number of cylinders) involves certain problems of its own, which, in conjunction with the fact that such engines are not common in full-size practice, have often deterred model engineers from attempting their construction. Nevertheless, there is much to be said in favour of using more than one cylinder in a two-stroke, especially when it is intended to be used in a type of model where the ordinary single is out of character. Mr. Boler has machined the structural parts of this engine from solid duralumin, and the main body is of monobloc design, but is split on the shaft centre line, the assembly being bored horizontally to form the crankcase, and vertically, to take the four cylinder liners; the head is also in one piece, to cover the four cylinders. The four-throw crankshaft is machined from the solid and the throws are spaced 90 deg. apart, the firing order being 1-3-4-2.

Connecting-rods with strap-type big-ends, of similar design to those of the "Ladybird" engine, are fitted, but the timing and arrangement of the exhaust and transfer ports are taken from the design of the "Zephyr" $2\frac{1}{2}$ c.c. single-cylinder engine published in the "M.E." shortly after the war. Instead of using a rotary valve

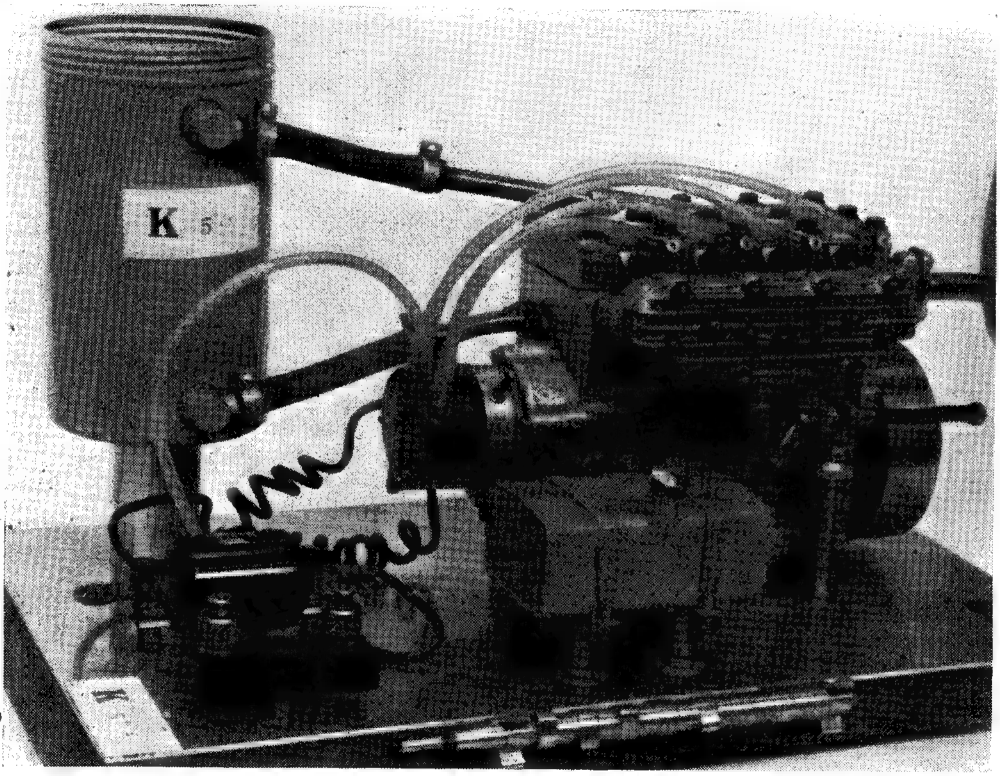


F. Boler's original design 10 c.c. four-cylinder two-stroke

for admission, [redacted] in the latter engine, however, port admission is used, and the inlet manifold is formed by a recess milled in the side of the cylinder block, and covered by [redacted] flat plate, to which the carburettor is attached. The latter is of the type recently described for [redacted] [redacted] the "Phoenix" 15 c.c. engine, with barrel throttle and mechanical compensation. A self-winding starter, similar to that of the "Atom V" engine, is fitted behind the flywheel. These features [redacted] of interest, [redacted] showing how fragments of "M.E." designs can be—and very often are—adapted and co-ordinated by individual designers to form the basis of successful individual engines.

it might easily be overlooked [redacted] the exhibition stand, or taken for [redacted] non-working model; but it is built by an old hand whose exhibits at previous exhibitions have always contained [redacted] than met the eye [redacted] first sight, and have often been both [redacted] surprise and [redacted] revelation on close inspection.

The small number of entries in the model racing car section bears no relation to the wide popularity of this type of model and again, it is difficult to understand what all the constructors [redacted] doing. It is true that the model racing cars built from commercial kits, [redacted] fitted with ready-made engines, far outnumber those individually constructed, but even so, there are sufficient of the latter known to



The 15 c.c. "Seal" four-cylinder engine by A. B. Langley, of Sheffield

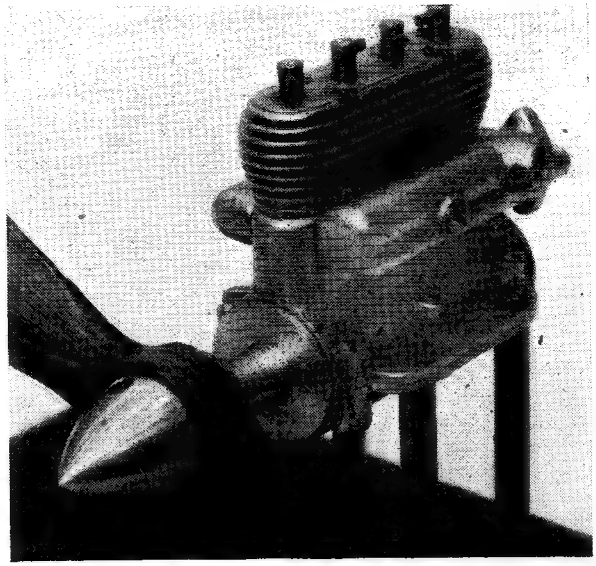
The four-cylinder engine by G. C. Seymour, of Southwick, must surely be [redacted] of the smallest "multis" ever constructed, but there is every reason to believe that it is quite [redacted] successful working model. It has [redacted] total cubic capacity of 1.3 c.c., and is of the compression-ignition type, with separate contra-piston compression adjustments for each cylinder. As in the previous example, the engine is of monobloc construction, and appears to have its major components machined from solid light alloy. An exhaust manifold is fitted on each side of the cylinder block, with [redacted] inlet manifold on [redacted] side only, immediately below the exhaust. The appearance of this tiny engine is not at all spectacular, and

be in existence to put up a brave show. On present indications, [redacted] cannot help be a little dubious of the future of model racing cars, at least in so far as they [redacted] associated with serious model engineering. The most interesting exhibit in this section is that shown by Mr. C. W. Field, of Reading, who is well known for his craftsmanship in this form of model and has won distinction [redacted] previous exhibitions. It is built to $\frac{1}{8}$ scale, and is powered by [redacted] 10 c.c. two-stroke engine of his own design, apparently following fairly orthodox practice [redacted] far as [redacted] be [redacted] from external features. The engine of the [redacted] made by A. E. Haswell, of Nuneaton, also of 10 c.c., is built to the "Ensign" engine design and apparently from

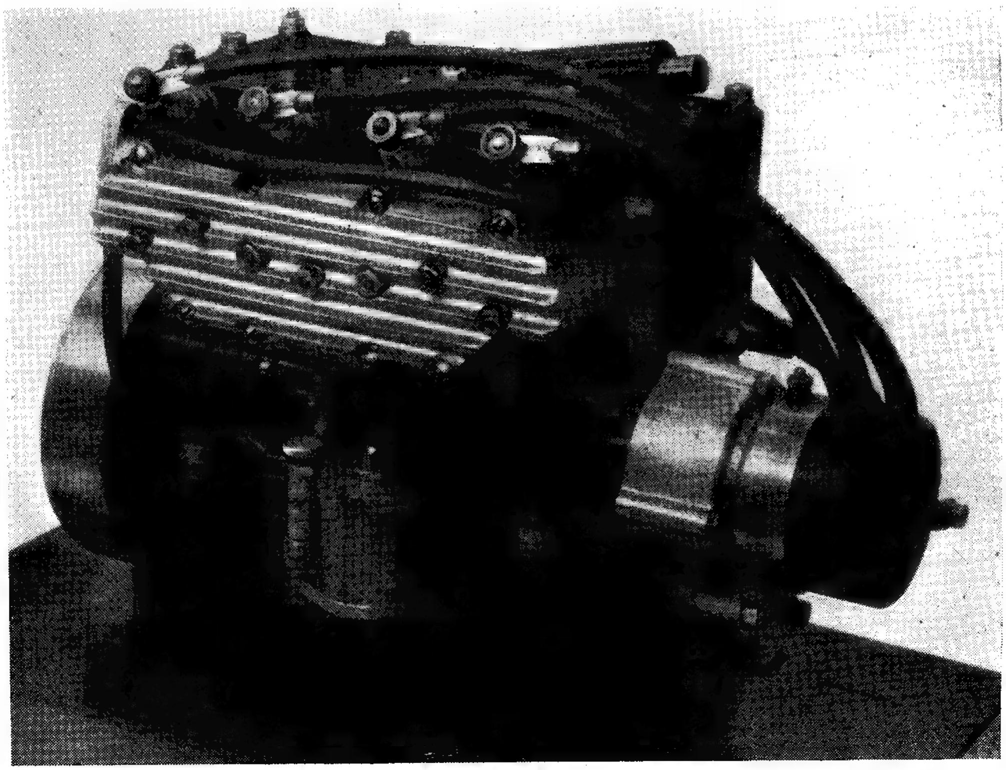
standard die castings.

Only one example of a racing hydroplane was entered in the competition class, and here again this is not at all representative of the activity known to exist in this branch of model engineering. However, the engine of this boat, by G. D. Reynolds, of Farnborough, is of more than ordinary interest as an example of individual design. It is of 15 c.c., with overhead valves, operated directly from an overhead camshaft, which is driven from the main shaft by a vertical shaft and bevel gearing. One criticism of this arrangement is that the camshaft and valve gear, being left completely open, would be difficult to keep lubricated at high speed, and under heavy duty. Beyond this, however, the engine is well designed, and the workmanship good; the boat, as a whole, should be capable of giving quite a good account of itself in any competition in the event of its owner choosing to enter it.

(*To be continued*)



Smallest of all the multi's, the 1.3 c.c. four-cylinder c.i. engine, by G. C. Seymour, of Southwick



" Twice as large as life "—the 120 c.c. " Seal Maximus " by A. L. King, of Hull

*Traction Engine Models at the 1950 "M.E." Exhibition

by W. J. Hughes

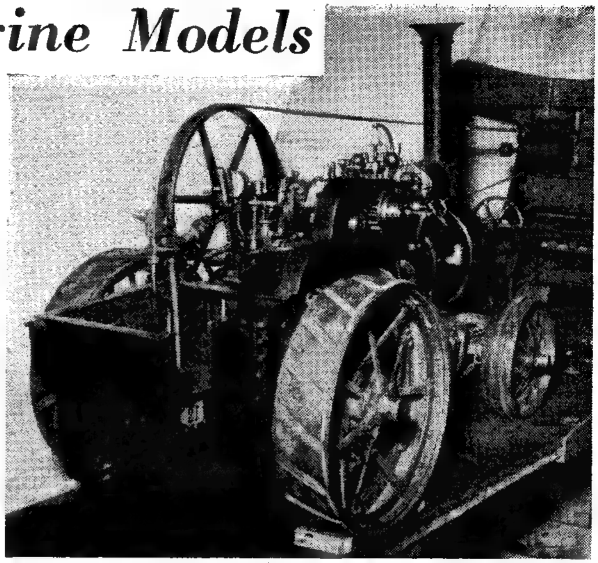


Photo 6.—Mr. C. E. Shackle's forward-steering Clayton & Shuttleworth double-cylindered traction engine of 1866, *coupled to the threshing machine*

A VERY nice exhibit by M. W. Head, of Marlborough, was [redacted] set of gears, cut in high-tensile steel, for the transmission of [redacted] 1½-in. scale showman's engine. These had all been cut, including bevel wheels and bevel-pinions, for the compensating-gear (differential to most folks!) on an M.L.7 lathe, and if the rest of the work [redacted] the engine is up to this standard, it will be [redacted] pleasure to describe it in due course.

The name of C. E. Shackle is well-known to the older readers of THE MODEL ENGINEER [redacted] [redacted] keen enthusiast on any form of steam agricultural machinery, although he himself is not very vocal about his own work. I do not think there will be many model engineers today who started that activity before Mr. Shackle, for as early as 1890 (while still at school) he started to build a 3-in. scale traction engine. That same engine is still going strong, being steamed two or three times a week, and has needed very little done in the way of repairs or even adjustment in its sixty years of life. But then, of course, more than half-a-century is nothing to [redacted] traction engine—unlike the i.c.-engined counterpart which falls to pieces after [redacted] few years! The 3-in. scale job [redacted] her keep too, in sawing and hauling timber, as was described in these pages during the late war.

**Continued from page* 310, *"M.E.," August* 31, 1950.

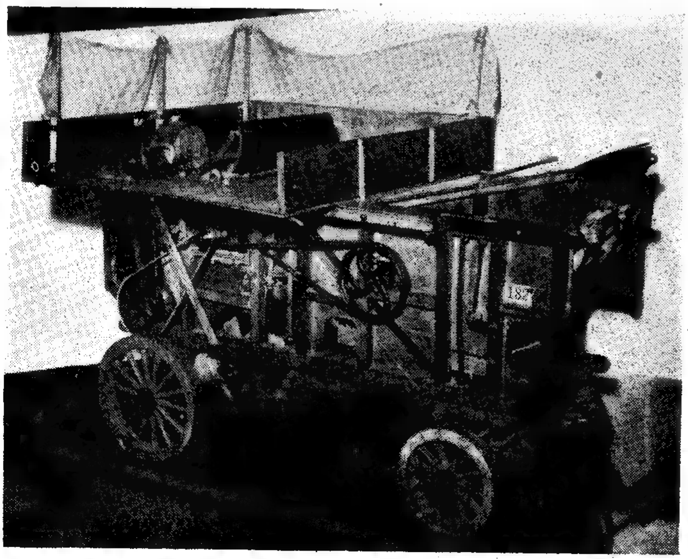


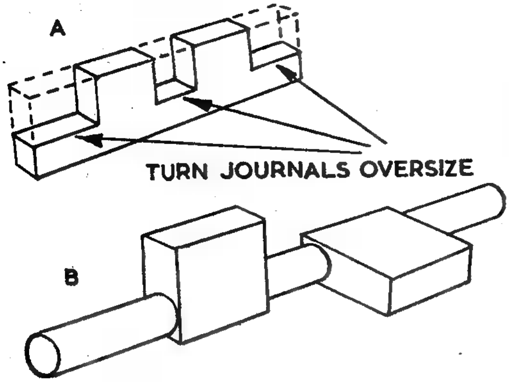
Photo 7.—*Mr. Shackle's* 1904 *Ruston Proctor threshing machine, which was driven by the C. &. S. traction engine*

There is no doubt that one of the models which created most interest at the "M.E." Exhibition was Mr. Shackle's threshing set, which was in motion for much of the time, though driven from [redacted] electric motor under the baseboard, and not under steam. Of this set, the engine was [redacted] Clayton & Shuttleworth, and the threshing machine a Ruston Proctor.

The C. & S. Traction Engine

The prototype of the traction engine was built by Clayton [redacted] Shuttleworth, of Lincoln, as long ago as 1866, and in December of that year [redacted] acquired by Mr. Musto, farmer, of Harlington. The engine [redacted] double-cylindered, of 10 n.h.p., with the slide-valves between the cylinders.

The model [redacted] completed just after 1946, having been



Central journal heated and twisted to bring cranks at 90 *deg.; journals then finished to size, and cranks cut out and turned*

built largely from old photographs of the prototype, although in the later stages some drawings were acquired which, while not complete, did throw some light on one or two features of which the builder was not certain. They also supplied confirmation of the surprising accuracy of some of his reasoning, incidentally!

Mr. Shackle says it was an awful job scheming [illegible] the valve arrangements to fit in the very confined space between the cylinders. Eventually tubes were taken through the valves themselves, passing right through the exhaust cavity, and were brazed in position, so that the valve-rods could go right through the tubes, with [illegible] lock-nut each side, so driving the valves.

The double-throw crank was made from flat bar material in the manner sketched, which saved having to build it up or to turn it from the solid. Having twisted the centre part at 90 deg., throw-plates were attached and the crankshaft turned in the normal way.

The somewhat intricate bearing-brackets for the crankshaft were built up in plate material. The method was to draw them carefully, to develop the shape of the sides, and to cut out in paper. The paper shapes were used to make trial shapes in thin sheet, which were fitted together and found satisfactory, so that the final shapes could be cut out in thicker sheet, bent up, and welded together and to the solid top which carries the actual bearings.

The gear-wheels were also built up, by bending up the rims from square-section material, and welding them and the bosses to centres cut from thick sheet. They were then trued up in the lathe, and the teeth cut.

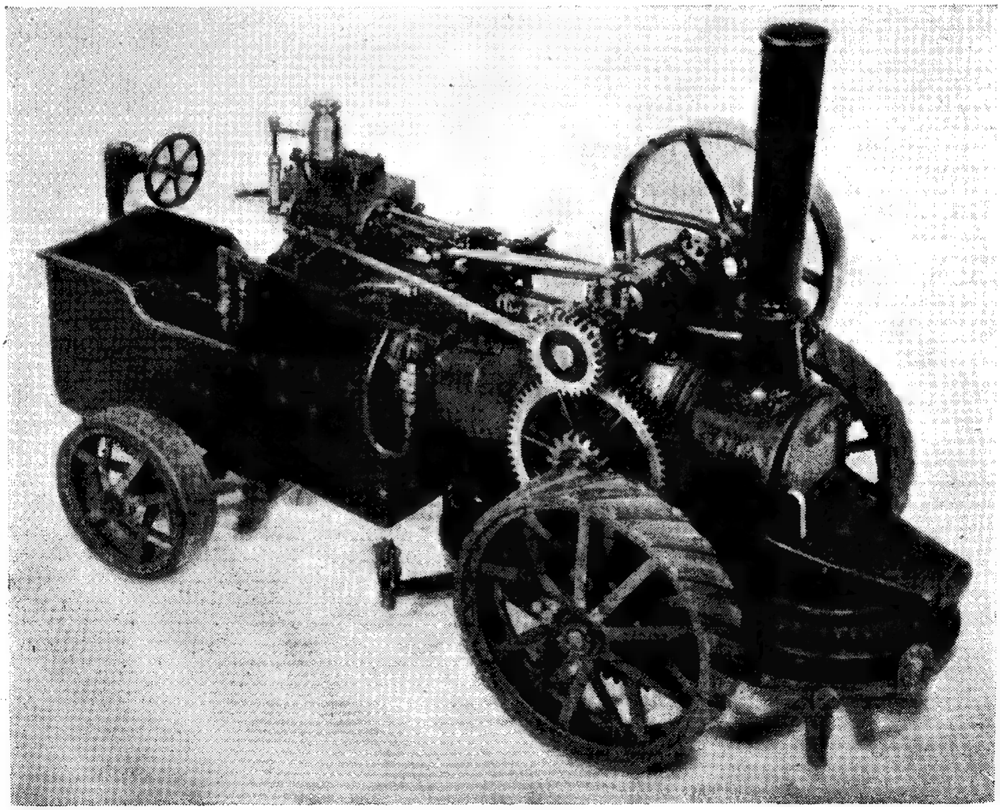


Photo 8.—*Another "period-piece"—the Fowler double-drum ploughing engine of* 1868. *This machine was driven bunker-first*

Layout of the gearing is very interesting. On the crankshaft [redacted] mounted two pinions; one of these can be [redacted] Photo 6, but the other one, which is smaller to give [redacted] slow speed, is behind it and in line with (though not meshed with) the intermediate spur-wheel. The larger (visible) pinion [redacted] be slid inwards, on keyway and feather, to engage with the spur-wheel; to allow this it is hollow behind, and when engaged envelopes the slow-speed pinion. Thus the " fast " speed is engaged.

To engage slow speed, the fast-speed pinion is first withdrawn. Now the intermediate spur-wheel is mounted [redacted] stud, which can slide in [redacted] angular slot cut in the bearing bracket. A clamping-nut having been slackened, the stud is slid down the slot until the spur-wheel engages the slow-speed pinion, [redacted] well as the spur-wheel on the second shaft, thus giving direct drive in slow speed. This shaft extends across the engine behind the firebox, and the spur-wheel just mentioned carries [redacted] bevel-type compensating-gear (differential), while pinions [redacted] both ends of the shaft drive large spur-wheels fixed to the hind wheels. The hind axle is thus not driven, but it [redacted] " float " in the main bearings, which [redacted] fitted with oil-boxes.

Hind wheel hubs [redacted] fabricated to represent the originals with spokes cast in. In the prototype, the spokes of the front wheels were cast into the rims [redacted] well as the hubs, so these also were fabricated by welding and brazing. The flywheel, too, was welded up, with separate spokes, boss, and rim.

A sheet-steel platform is riveted to the underside of the smokebox, projecting forwards and carrying the steering column and [redacted] seat for the steersman. The steering wheel is fixed to [redacted] short shaft carrying [redacted] worm, which engages with a pinion on [redacted] vertical shaft. At the bottom of the vertical shaft is a segment to which the steering chain is connected. The latter is made from flat links of $\frac{1}{4}$-in. $\times$ $\frac{1}{16}$ in. section, and is fastened by shackles to the fore-carriage, which is of wooden construction, like the spud box behind it. The ordinary type chain which may be seen in the photograph, just inside the wheel, is attached to the firebox to restrict the lock of the front wheels; there is, of course, another at the left-hand side.

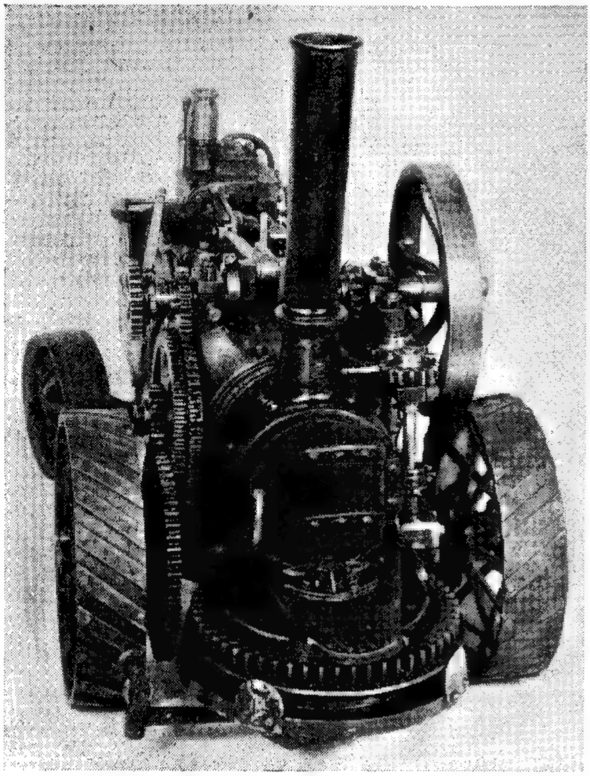


Photo 9.—View of the Fowler ploughing engine to show drive to hind wheels and to winding-drums, as described in the text

The Threshing Machine

Chief dimensions of the threshing machine were taken from [redacted] actual Ruston Proctor prototype built in 1904, but the details of the internal machinery were chiefly obtained from a Ruston Proctor catalogue. This model was finished in 1943.

Obviously the construction is principally in timber, including the carrying wheels. The pulley wheels with their curved spokes, which look like castings, were built up by cutting the centres out of $\frac{3}{16}$-in. plate, adding the bosses and [redacted] rim bent up from $\frac{1}{2}$ in. $\times$ $\frac{1}{8}$ in. strip, and brazing the lot together. Then the wheels were trued up and bored in the lathe.

To see this set in action was most satisfying; the engine had the authentic slight rock of the big ones, and the slap and rattle of the " drum " was music, too. To many of the onlookers it must have brought [redacted] breath of days that are almost no more, [redacted] it did to me.

The Double-Drum Ploughing Engine

Photos [redacted] and 9 show a model of [redacted] Fowler double-drum ploughing engine of 1868-70. This was finished by Mr. Shackle about 1936, being built from [redacted] drawing published in *Engineering*, in 1868. But this was not [redacted] detailed drawing, and in particular it [redacted] difficult to figure out how the gearing worked. However, Mr. Shackle went to see Fowler's, and though almost all the original drawings had been destroyed, he [redacted] fortunate in securing a general arrangement drawing of 1871, which gave him the information he sought.

The two-speed gear is [redacted] the left-hand side, and works as follows. (The engine proceeds bunker first, by the way.) There [redacted] two driving pinions [redacted] the end of the crankshaft, and of these

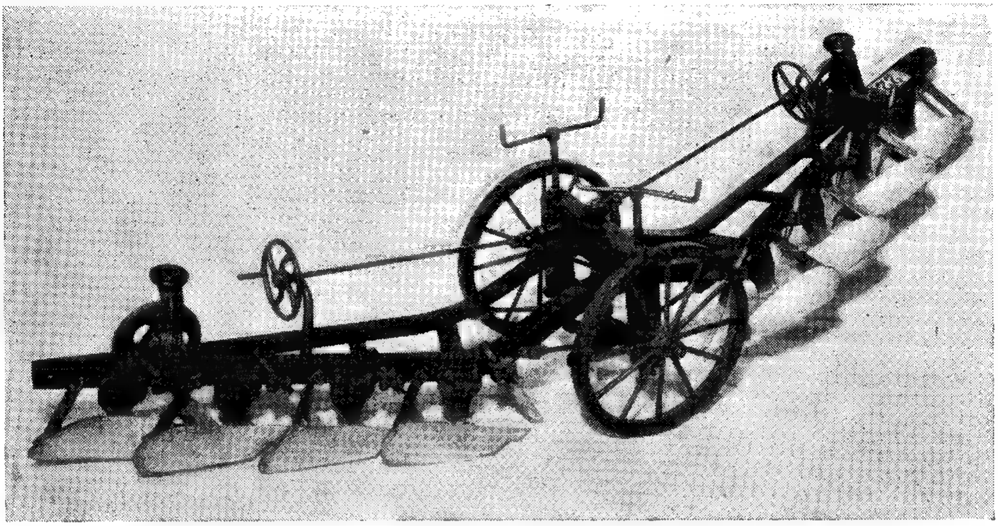


Photo 10.—The Fowler balance plough [redacted] used for steam-ploughing operations

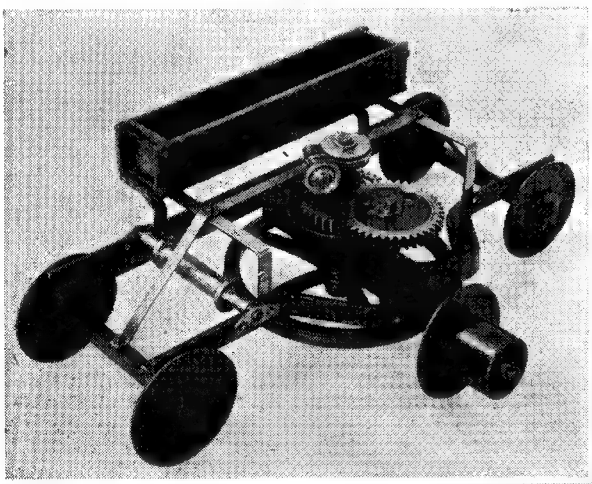


Photo 11.—The Fowler self-moving anchor for steam-ploughing. The box was loaded with stones to prevent overturning

the smaller, or slow-speed pinion, on the inside, is free to revolve on [redacted] plain part of the shaft, not being secured to it in any way. It is in mesh permanently with the inner gear of the two-speed spur-wheel mounted on [redacted] stub-shaft below it.

The fast-speed pinion, on the outside, slides on the shaft, possessing [redacted] feather which slides in [redacted] keyway machined in the shaft. Thus as the crankshaft rotates, the fast-speed pinion must turn with it.

Now, in the position shown in the photographs, the engine is free running, but if the fast-speed pinion is slid to the right, by means of the long clutch lever, dogs cut in its boss engage with dogs cut in the boss of the slow-speed pinion, thus driving the latter at crankshaft speed, and the engine moves forward in slow gear.

To engage fast speed, the fulcrum-pin of the clutch lever is lifted out, the fast-speed pinion is taken off and reversed. It will be seen that it is hollow or cup-shaped on the side which is *now*

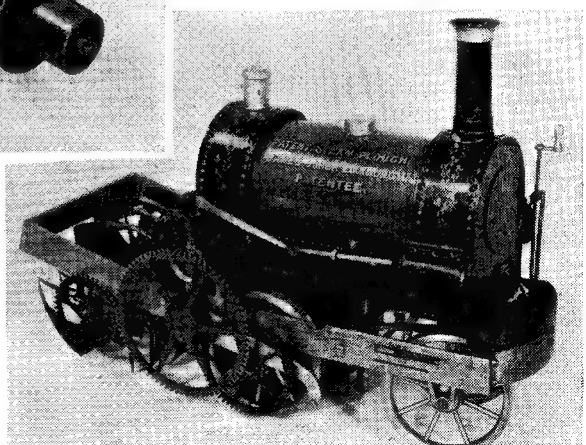


Photo 12.—The century-old demonstration model of the Usher rotary steam plough. The vertical shaft with handle against the smokebox is for steering

inside, and thus may be slid into engagement with the smaller of the two-speed spur-wheels, the cup enveloping the dogs on the smaller pinion. The engine will now proceed in high gear—a procedure which looks [redacted] first sight impossible, for *both* pinions on the crankshaft [redacted] rotating! The fact is, of course, that the small pinion is being driven by the two-speed spur-wheel at a faster speed than the crankshaft, but has [redacted] mechanical connection with it.

mounted on top of the cylinder-block, as is the regulator-valve. As with the Clayton & Shuttleworth engine, the boiler is coal-fired, of course.

The bunker is attached to the firebox, and steering gear to the bunker, working in [redacted] similar manner to the C. & S. engine.

Ploughing Tackle

Other exhibits of Mr. Shackle's were [redacted] Fowler balance plough (Photo 10), [redacted] Fowler self-moving

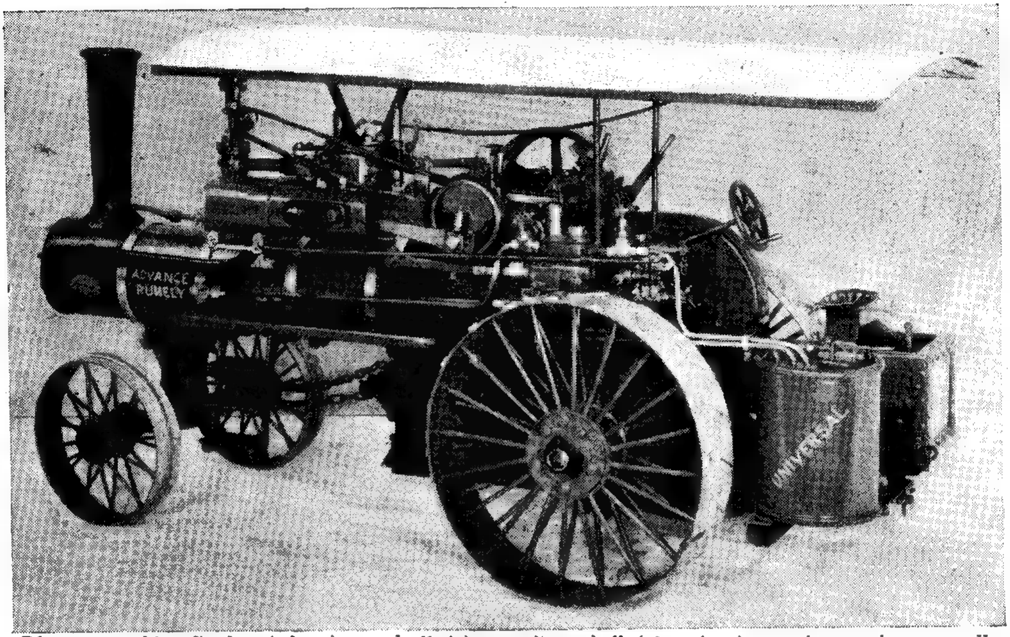


Photo 13.—Mr. J. Davies' 1-in. scale "Advance-Rumely" (American) traction engine, a well-detailed and unusual model

anchor (Photo 11), and Usher's steam plough (Photo 12).

It is not proposed to describe these fully here, for I hope to deal with the subject of steam ploughing in my forthcoming series of articles "Talking About Steam—" of which it is anticipated publication will start soon.

Briefly, however, the balance plough [redacted] hauled to and fro across the field by a wire cable attached to the engine: in one direction, [redacted] set of plough shares was used, and in the other the other set came into operation. The frame of the plough could be raised or lowered, to regulate the depth of cut, by [redacted] of the central handles and the handwheel [redacted] either end. The steersman, who sat on the plough, kept the furrows straight by means of the other handwheels, which pivoted the frame about [redacted] central vertical axis.

In the "single-engine" system, the cable passed from the engine to the other side of the field, round the large horizontal pulley sheave on the "anchor," and back to the engine, [redacted] that the plough could be hauled to and fro. The anchor had thin disc wheels which cut into the earth to resist the tremendous side-pull. When

Drive to the Winding Drums

For the purposes of the particular ploughing system for which this engine [redacted] used, it [redacted] necessary for each winding drum to be driven in turn by the engine. To accomplish this there are two vertical shafts [redacted] the right-hand side of the engine. One of these is vertically below the crankshaft, and is driven from it by the bevel gear seen.

A spur-pinion integral with the shaft bevel-wheel meshes with an idler pinion on [redacted] vertical stub-shaft, and the idler meshes with a pinion [redacted] the second vertical shaft, [redacted] that both vertical shafts rotate together as the crankshaft revolves.

At the foot of the vertical shafts are dog-clutches operated by a rocking lever. Each clutch [redacted] be engaged with [redacted] pinion loosely mounted on its vertical shaft, each pinion driving its own drum by [redacted] of the large spur-ring shown.

The control lever [redacted] arranged that both clutches could be free, or that one or other drum could be driven, but not both together.

The Engine

The engine is single-cylindered, with Stephenson valve-gear. A Salter-type safety-valve is

the small handwheel at the top of the shaft [redacted] tightened, the small winding drum above the sheave [redacted] rotated through the gearing shown (similar to lathe back gear): this hauled on [redacted] rope attached to [redacted] anchor placed at right-angles to the main rope, and so moved the apparatus forward as required.

Usher's Steam Plough of 1849

The model of Usher's machine shown is an historical one, being [redacted] demonstration model built either by or for the original inventor of this system, and it was acquired by Mr. Shackle from a descendant.

There were two cylinders, one on either side, with [redacted] crankshaft just behind the firebox. Through the gearing shown, this drove the engine forward, and at the [redacted] time rotated the four triple plough shares at the rear. The frame carrying these pivoted about the axis of the large spur-wheel, and thus the shares could be raised or lowered. This system, too, will be mentioned in [redacted] future article.

The American Traction Engine

As will be [redacted] from Photo 13, Mr. Davies' [redacted] Advance-Rumely" engine is a very well-built and well-detailed model. It is all the [redacted] creditable because no scale drawings were available, and it is built from photographs and other information.

It contains many features unusual to our eyes, including the overhung crank, and the valve-gear, which somewhat resembles the Hackworth type. There is also [redacted] large separate steam-dome, from which [redacted] pipe runs to the valve-chest, containing [redacted] rotary-type of regulator-valve and with [redacted] Pickering-type governor. The whistle and safety-valve are mounted on the dome.

The spidery-looking wheels are also unfamiliar to one used to tee-rings and flat spokes. The rims are merely bent round from strip, with the ends lapped, and riveted. The hind axle is sprung, and the front axle [redacted] pivot sideways to allow for uneven ground.

Like most American engines, [redacted] clutch is fitted in the flywheel, and there is a single speed only. A pump just above the hind wheel is gear-driven from the crankshaft at [redacted] reduced speed. It lifts water from the round tank shown, which is matched at the other side of the driver's platform by [redacted] square coal-bunker. This latter carries [redacted] very realistic hand-painted trademark, by the way.

The boiler-fittings [redacted] very neatly made, including especially the water-gauge and tiny wheel-valves. It is, in fact, the small details on this engine, as on any model, which help to give the realism achieved.

As to performance, Mr. Davies told [redacted] in a recent letter that she steams very well, but he hasn't tried her under load yet [redacted] the lubricator isn't fitted. We may hope to have [redacted] report on that later on, perhaps.

THE 1950 "M.E." EXHIBITION PRIZE WINNERS

The Club Team Competition
Birmingham Ship Model Society.

The Aircraft Trophy
Luton and District Model Aeronautical Society.

The "M.E." Ship Model Societies Challenge Trophy
Sheffield Ship Model Society.

Individual Championship Cups

Locomotives.—P. J. Dupen, of Goodmayes, Essex. 5-in. gauge contractor's saddle-tank locomotive, *Lord Mayor.*

Steam and Motor Ships.—No award.

The Keen Cup (Working Model Steamers).—H. G. Ross, of Wallington, Surrey. North [redacted] steam drifter, scale $\frac{3}{8}$ in.-1 ft.

Sailing Ships.—I. W. Marsh, of Barry Dock, South Wales. Clipper ship *Thermopylae*, $\frac{1}{8}$-in. scale.

General Engineering Models.—C. B. Reeve, of Hastings, Sussex. One-year weight-driven clock with perpetual calendar.

Silver Medals

F. W. Hebblethwaite, of Middlesbrough, Yorkshire. $3\frac{1}{2}$-in. gauge G.N.R. [redacted] Stirling" locomotive.

E. N. Taylor, of Gosport, Hampshire. Waterline model of M.V. *Gartwood*, scale 1 in.-25 ft.

T. Fletcher, of Colne, Lancashire. Working model of steam yacht *Iolaire*, $\frac{3}{4}$-in. scale.

Rear-Admiral C. M. Blackman (Retd.), of Ashton, Hampshire. Rigged model of the 1st rate *Prince* of 1670.

F. A. A. Pariser, of Castle Bromwich, Warwickshire. H.M.S. *Victory*, scale 1/44 in.

C. J. Clarke, of West Bromwich, South Staffordshire. American brig *Pilgrim*, 1834, scale $\frac{3}{16}$ in.-1 ft.

D. McNarry, of Barton-on-Sea, Hampshire. Waterline model of R.M.S. *Caronia*, scale 1 in.-50 ft.

Mrs. I. McNarry. Waterline model of P.S. *Great Western, circa* 1837, scale 1 in.-28 ft.

J. W. Thomas, of Cardiff, Glamorganshire. Collection of 125 builder's tools, scale $\frac{1}{8}$ in.-1 ft.

Bronze Medals

C. G. East, of East Molesey, Surrey. $2\frac{1}{2}$-in. gauge [redacted] L.B.S.C.'s" *Princess Royal.*

A. A. Sherwood, of London, S.E.9. [redacted] OO"-gauge Virginian Railway 2-10-10-2 Mallet compound locomotive.

R. V. Shelton, of Dunstable, Bedfordshire. Scenic waterline model of the *Baron Elphinstone*, scale 1 in.-20 ft.

E. N. Taylor, of Gosport, Hampshire. Waterline model of M.V. *Milford Viscount*, scale 1 in.-25 ft.

J. E. Gardner, of Teddington, Middlesex. Deep sea trawler, scale 1/3 in.-1 ft.

R. S. Anderson, of Willington-on-Tyne, Northumberland. Portuguese passenger liner, M.S. *Angola*, scale $\frac{1}{8}$ in.

G. W. Miller, of West Drayton, Middlesex. Working model of "Javelin" class destroyer, scale 1/50.

A. S. Ablett, of Ruislip, Middlesex. Working model Vosper standard motor yacht, scale 2/3 in.-1 ft.

E. N. Bays, of Sheffield, Yorkshire. Radio-controlled R.N.L.I. lifeboat, cabin class.

R. G. W. Cramp, of Barkingside, Essex. Model of four-masted barque *Queen Margaret*, $\frac{1}{8}$ in. scale.

H. Hukin, of Southport, Lancashire. Morecambe Bay prawner, *circa* 1910, scale $\frac{1}{2}$ in.-1 ft.

W. C. Morrison, of Southall, Middlesex. Marblehead class model racing yacht.

P. M. Wood, of London, W.8. Model of a merchant vessel of the Levant Company, *circa* 1590, scale 1 in.-3 ft.

G. D. Reynolds, of Farnborough, Hampshire. Experimental hydroplane.

R. Carpenter, of Brighton, Sussex. Model of M.S. *Herta Maersk* with tug approaching, scale 1 in.-50 ft.

Captain A. Thomson, of M.V. *Donacilla*. (Anglo-Saxon Petroleum Co. Ltd.) Waterline model of four-masted barque *Granada*, scale 1 in.-20 ft.

K. P. Lewis, of Birkenhead, Cheshire. Model of Eastern Region cross-channel steamer *Arnhem*, scale 1 in.-75 ft.

A. R. Todd, of Uddingston, Larnarkshire. Two-masted topsail schooner (coaster), scale $\frac{1}{16}$ in.-1 ft.

S. H. Clarke, of Stockton-on-Tees, Durham. Single-cylinder high speed vertical engine, governed and reversing.

H. J. Hawker, of Northampton. Eastern Amos "Grasshopper" beam engine, scale 1 in.-1 ft.

J. W. Ayres, of Stockton-on-Tees, Durham. Free-lance two-cylinder reversing horizontal mill engine.

F. G. Boler, of Leatherhead, Surrey. Four-cylinder, two-stroke petrol engine, spark ignition.

H. E. Dear, of London, E.11. Parish church of West Ham, London, scale 4 mm.-1 ft.

F. J. Pateman, of Cambridge. Horse-drawn gypsy caravan.

P. Winton, of Wembley, Middlesex. State postillion landau, scale $1\frac{1}{2}$ in.-1 ft.

G. C. Seymour, of Southwick, Sussex. Model push bike, scale $2\frac{1}{2}$ in.-1 ft.

M. Collins, of Northfleet, Kent. Thames sailing barge, *Kathleen*.

Diplomas

Very Highly Commended—28 awards.
Highly Commended—27 awards.
Commended—14 awards.

SPECIAL PRIZES

The F. W. Atkinson & Co. Prize
F. G. Boler, of Leatherhead, Surrey. Four-cylinder two-stroke petrol engine, spark ignition.

The Michael C. Bradbrook Prize
J. Knighton, of Ilkeston, Derbyshire. $3\frac{1}{2}$-in. gauge, $\frac{3}{4}$ in. scale L.M.S. locomotive *Doris*.

The Ferguson Prize
S. H. Clarke, of Stockton-on-Tees, Durham. Single-cylinder high speed vertical engine, governed and reversing.

The Fylde Pre-group Locomotive Prize
C. R. Jeffries, of Wembley, Middlesex. 5-in. gauge $1\frac{1}{16}$-in. scale, G.W.R. pannier tank locomotive.

The Hampshire Prize
Mrs. I. McNarry, of Barton-on-Sea, Hampshire. Waterline model of P.S. *Great Western circa* 1837, scale 1 in.-28 ft.

The Lang Prize
Rear-Admiral C. M. Blackman (Retd.), of Ashton, Hampshire. Rigged model of the 1st rate *Prince* of 1670.

"The Model Railway News" First Prize
J. H. Guarnori, of Walton-on-Thames, Surrey. Two "OO"-gauge (16.5 mm.) locomotives: (a) L.S.W.R. "M7" class 0-4-4T passenger tank and (b) L.S.W.R. "415" class 4-4-2T passenger tank.

"The Model Railway News" Second Prize
Group Captain J. D. Rutherford, R.A.F., Newton, Nottinghamshire. "OO"-gauge L.N.E.R. class "A3" Pacific locomotive *Felstead*.

"The Model Railway News" Third Prize
A. F. Jackson, of Heaton Norris, Cheshire. "OO"-gauge (18 mm.) L.M.S. 0-6-2T Webb coal tank.

The "Model Ships and Power Boats" Prize
G. W. Miller, of West Drayton, Middlesex. Working model of "Javelin" class destroyer, scale 1/50.

The New York Society of Model Engineers Inc. Prize
K. N. Harris, of Wealdstone, Middlesex. Hydraulic drawbar pull indicator and a 5-in. gauge "Crocodile" type driver's truck.

The A. J. Reeves & Co. Prize
E. M. Thomas, of Ottery St. Mary, Devon. $3\frac{1}{2}$-in. gauge working model 2-8-0 × 0-8-2 L.N.E.R. Garratt steam locomotive.

The W.K. Waugh Prize
A. Bielby, of Hull, Yorkshire. $3\frac{1}{2}$-in. gauge 0-4-0 tank locomotive, *Shortie*.

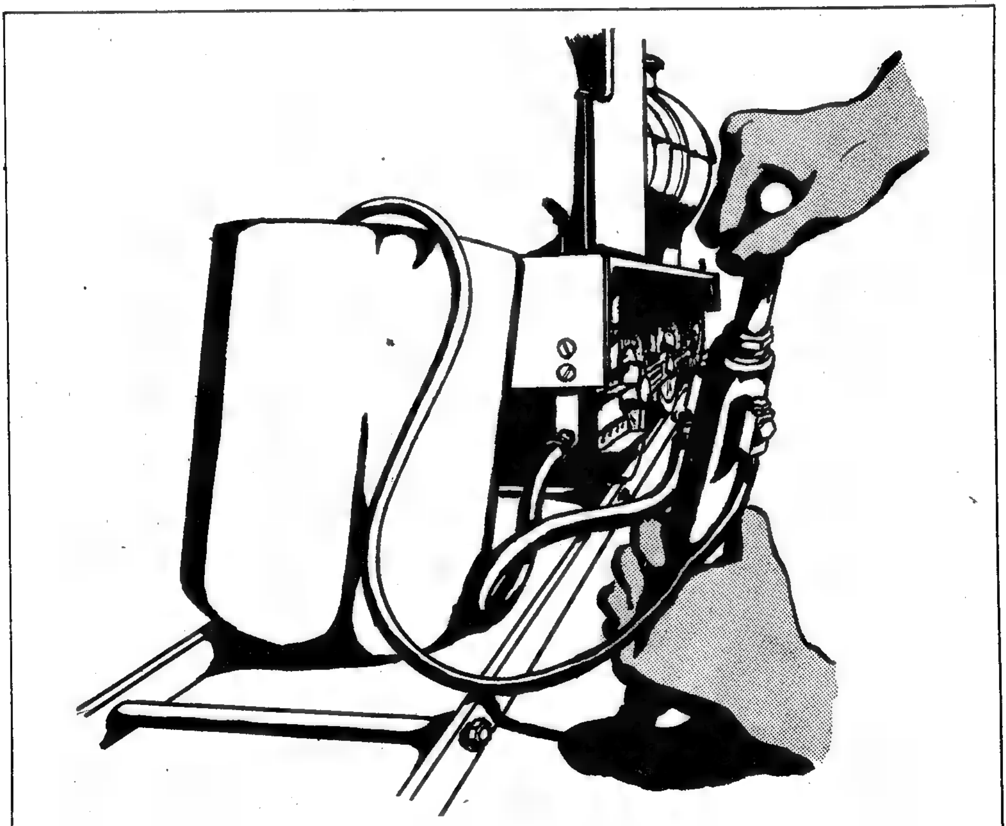
The "Wellingham" Cup
Dr. F. Machanik, of Liverpool, 17. Ocean-going steam tug.

Improvements and Innovations

No. 10—Pumps and Things

by "1121"

SOME time ago we were discussing, with a well-known model locomotive owner, the question of his providing himself with a second locomotive, and in the course of [redacted] recital of his specifications for the proposed engine he made the stipulation that it must have "an axle-driven pump, an injector, and [redacted] good big tender hand-pump." to stop. The injector, naturally, is to supplement the axle-driven pump should this at any time fail to satisfy the demands of the boiler, or should the engine be required to stand for any length of time, when the axle pump cannot be worked. The "good big tender hand-pump," presumably, is for use in the event of the injector's failing to function, and we cannot help wondering whether



The "Beer-pump" in action

Now we believe in, and on occasions preach, the sanctity of individual opinion when it comes to hobbies, and we would not presume to question this principle of safety and double-safety, but, to air our *own* opinion, we cannot help feeling that once one starts this it is difficult to predict where it may lead to, and decide where it would not be advisable to install another pump somewhere also in [redacted] the tender hand-pump should go on strike. We happen to know that the locomotive owner to whom we refer has his own grounds for this policy—he once had [redacted] boiler run dry for him by another driver, but [redacted] venture to suggest that the remedy for

this sort of thing lies in making sure that his engine is safe from the consequences of neglect of this sort, not by the installation of so many pumps that any nitwit should be capable of keeping water in the boiler, but by ensuring that no such nitwit is allowed to handle the engine without watchful supervision. After all, the excuse for running [redacted] boiler dry is so small [redacted] to be practically non-existent; we [redacted] not, when running our engines, tied down by the necessity of keeping going until [redacted] place is reached where water can be procured if the tender is dry, [redacted] where the engine can be taken out of service should the trouble be more serious. A driver can, [redacted] any time, should he be in difficulties, stop and drop his fire without question of criticism from the owner of the engine or the track superintendent. We feel that to [redacted] alert driver any such emergency should become apparent long before the water reaches a level so low [redacted] to be dangerous, and if a man is likely to allow this state of affairs to materialise and do nothing about it, with only [redacted] pump and injector, he will be just as capable of doing so however many emergency pumps he has at his disposal.

The "Beer-pump"

Not one of the locomotives running on the S.M.E.E. track has [redacted] tender hand-pump, but we have provided against emergency with [redacted] item of equipment which, from time immemorial and for reasons we have been unable to discover, has always been known as the "beer-pump." We intimated, in our introduction to this series of articles, that of the various forms of equipment [redacted] be described some were new and [redacted] were old enough to have become institutions, and it is the fact that the beer-pump is one of these institutions that forms our rather flimsy and roundabout excuse for including these observations under the heading of "Improvements and Innovations."

A Cross-breed

The beer-pump is a kind of cross between [redacted] stirrup-pump and [redacted] garden syringe. It consists, inevitably, of [redacted] barrel and [redacted] plunger, with suction and delivery valves in boxes at the top end of the barrel, the lower end being blanked off. On the delivery side is fitted [redacted] length of armoured hose, capable of withstanding pumping against boiler pressures, and provided with [redacted] cycle-type knurled union nut at the end, which can be quickly screwed on to the pump by-pass pipe of an engine. All our engines [redacted] furnished with screwed by-pass pipes for this purpose, and for attaching [redacted] similar union-nut on the air-compressor line for steam-raising. The suction department of the beer-pump is merely [redacted] length of rubber tube with a filter at the end, which [redacted] be dangled in any bucket, can, or similar water-receptacle when the pump is in use. The capacity of the pump is such that half-a-dozen strokes is usually sufficient to restore the water-level to visibility in the worst cases—a very much quicker process than the most violent waggling of [redacted] tender pump handle.

For the Water-test

We are glad to be able to report that the occasions when the beer-pump has had to be called in [redacted] so [redacted] that [redacted] cannot remember when [redacted] the last: its more frequent [redacted] is for quickly filling [redacted] boiler with water for the water-test with which we invariably greet any unknown engine offered for our use, and our own familiar ones at regular intervals. We heartily dislike the process of unscrewing [redacted] safety-valve and filling the boiler from [redacted] can by means of [redacted] funnel stuck in the hole. We feel that this sort of thing encourages the questions, such as "How long does it [redacted] on one filling?" to which we [redacted] treated during our job of operating the track. The less obvious process of attaching our beer-pump to some mysterious connection down at the back end of the engine may, at the worst, call forth [redacted] query such [redacted] "What is that—oil?" to which we usually reply, "No—treacle," and the questioner goes away perfectly happy.

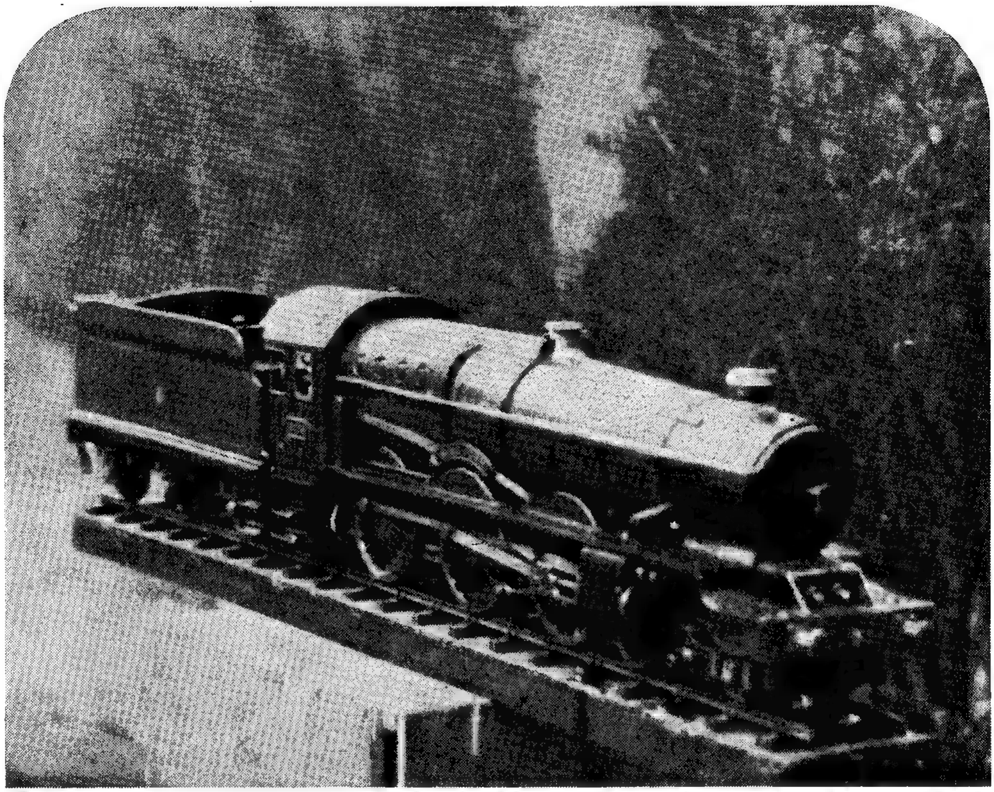
Approached with Cunning

We remember [redacted] time when [redacted] miniature injector [redacted] animal to be approached with calculated cunning. The necessity for creeping up [redacted] it from behind and taking it by surprise was an accepted rule. Furthermore, every specimen had its own particular whims, which had to be matched with the tricks appropriate to each individual's peculiar characteristics. Thus, more than once, the entire track gang has been clustered round a temperamental injector, in [redacted] effort to persuade it to see reason, and the owner has strolled up with some remark such as "What's up—won't she go?" and performed some absurdly simple sleight-of-hand, whereupon the offending article has immediately obeyed without further comment. This has appeared miraculous in the extreme [redacted] the time, and we have even heard disrespectful whispers of "fluke," but the answer, of course, is that the owner, being accustomed to repeated operation of this one injector, has merely applied automatically the methods to which he knows from long experience it will respond. At least, that's our story, and we're sticking to it.

Relying on Injectors

During the intervening years between those days and these, however, such advances have been made in the design of these little injectors by various people, all of whom deserve a share of the praise due, that they can now mostly be regarded with the [redacted] confidence as any pump, and there is [redacted] than one engine running [redacted] our track relying entirely on two injectors without the inclusion of pumps of any kind in its equipment, and [redacted] far [redacted] remember none of these has ever required the application of the beer-pump. Far from adhering strictly to a rule that [redacted] injector is [redacted] thing which, [redacted] it has been persuaded to work more or less satisfactorily, should be left severely alone and [redacted] account disturbed, we have now become accustomed to whipping off [redacted] offender without second thought, glaring [redacted] its [redacted] and putting it back, after which treatment it usually resumes its duties without [redacted] murmur, and all without even interrupting traffic.

An $\frac{1}{2}$-in. Scale G.W.R. "King John"



THIS model was commenced during the [redacted] and finished in 1947. The frames [redacted] cut out of mild-steel plate 3/32 in. thick, and the horn blocks riveted in position, the crank-axle is built up, pinned and brazed, the connecting-rods were fabricated to form [redacted] "I" section. The four cylinders are $\frac{11}{16}$ in. bore × $1\frac{1}{8}$ in. stroke with slide-valves, the inside valve gear is correct Walschaerts driven by eccentrics and rockers to the outside valve spindles. The reversing screw is $\frac{3}{16}$ in., 24-teeth, and takes [redacted] time to reverse when in a hurry.

It was interesting to notice the effect of the four-cylinder balance when testing the chassis on a stand with compressed air. When running on the inside cylinders only the shouldering was very marked, but with four cylinders the chassis remained steady.

The boiler barrel has a lapped joint at the bottom, the firebox has top girder stays, and was made in accordance with "L.B.S.C." ideas. Twelve $\frac{3}{8}$-in. tubes, and two $\frac{9}{16}$-in. tubes for the spearhead superheaters. I often have 100 lb. per sq. in. on it. The top feed pipe does not discharge [redacted] the safety-valve, but is carried forward away from the regulator valve to prevent priming. The steam and exhaust piping in the smokebox were a bit of [redacted] headache to couple up, so I made the smokebox to slide off, with slots for the outside steam pipes to remain in position, thus I [redacted] the various joints were tight.

In order to be true to prototype, [redacted] large displacement lubricator was fitted behind the firebox, the feed to the cylinders carried in [redacted] pipe along the boiler side on the right-hand side to the steam inlet manifold. This arrangement is very hit and miss. One does not know how much oil is going to the cylinders. If only [redacted] small sight feed could be made to work in $\frac{1}{2}$-in. scale. Perhaps Mr. F. Cottam could suggest something; his $\frac{3}{4}$-in. scale "King" [redacted] to have an excellent sight feed lubricator.

The boiler is fed by [redacted] twin pump driven by eccentrics and [redacted] tender hand pump which delivers direct to the suction valves of the twin pump, thus freeing the ball valves of the pump after standing the engine for [redacted] long time.

I experienced difficulty at first to get the fire to burn evenly, and had to close the front of the ashpan and enlarge the rear. The combustion must be very good. After [redacted] run, a small amount of fine dry ash collects in the smokebox and the tubes remain clean.

—F. H. HAMBLING.

Novices' Corner

A Table Stop for the Drilling Machine

WHERE [redacted] number of holes have to be drilled to [redacted] equal depth in [redacted] piece of work resting on the table of the drilling machine, difficulty may be found in maintaining the height setting of the table [redacted] it is swung to one side to bring a fresh work centre into position under the drill, for a large piece of work may have to remain centrally placed on the table in order to obtain the necessary support, and the table itself must then be adjusted accordingly. However, an

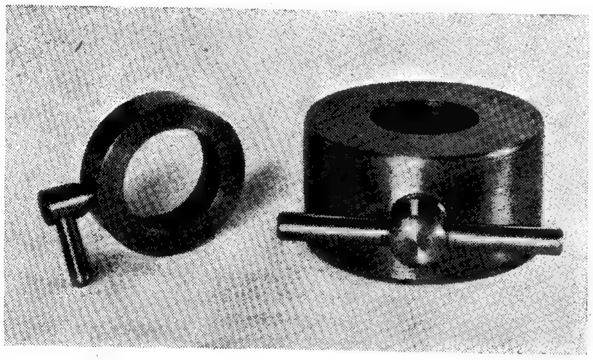


Fig. 1. Two forms of drilling machine table stops

adjustable collar sliding on the column of the machine will overcome this difficulty, [redacted] the collar can be clamped to the column, below the machine table, once the table height has been set. This enables the table to be swung to one side, without losing height by slipping down the column of the machine. The smaller of the two stop collars illustrated in Fig. 1 was made to fit the column of THE MODEL ENGINEER drilling machine designed by Mr. E. T. Westbury; the other stop collar shown in the photograph was designed for use with [redacted] larger drilling machine. These collars [redacted] easily m[redacted]de, [redacted] they consist merely of a steel or cast-iron ring fitted with [redacted] clamp-screw and [redacted] brass pressure pad to save the column of the machine from damage. The larger collar was, as [redacted] matter of fact, made in [redacted] very short time from standard shaft collar, and it has given good service over a long period.

There are occasions, however, when the full drill-to-table distance is required for drilling [redacted] large piece of work with [redacted] long drill, and in these circumstances the presence of the stop collar may not allow the table to be set low enough. This then entails detaching the drill headstock and the table before the collar can be removed. When [redacted] new drilling machine [redacted] recently built, [redacted] table stop [redacted] considered essential for convenient working, but in the light of past experience it was decided to make this stop collar readily detachable without having partly to dismantle the machine.

As before, this collar consists of [redacted] steel ring, but, [redacted] shown in Fig. 2, the collar is now split across its diameter into two equal parts that [redacted] clamped together by two Allen screws to grip the column of the machine; the appearance of the collar when in position on the drilling machine is illustrated in Fig. 3. The working drawings given in Fig. 4 are for a collar to fit [redacted] column $1\frac{1}{8}$ in. in diameter, but the dimensions can easily be scaled either up or down to suit [redacted] column of another size. The collar is turned from [redacted] short length of round mild-steel, and, after the largest available drill has been fed in from the tailstock for [redacted] distance of some $\frac{5}{8}$ in., the bore is finished exactly to size with [redacted] boring tool.

The bore size may be determined by measuring the column with the outside calipers and then transferring

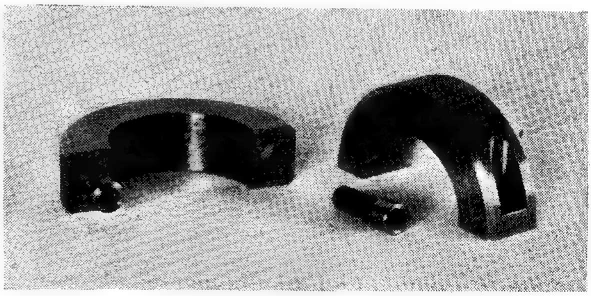


Fig. 2. Showing the parts of the detachable table stop

this setting to the inside calipers so that they can be used to gauge the bore.

If [redacted] piece of the material from which the column was made is available, this will also serve as [redacted] gauge for machining the bore to the correct size.

After the collar has been bored, a diameter reference line should be scribed across the face of the work and along both its sides. This [redacted] be done by mounting [redacted] V-pointed tool [redacted] its side at centre height in the toolpost and then locking and indexing the lathe mandrel by means of [redacted] detent. This detent engages either [redacted] even-numbered change wheel secured to the tail of the

mandrel, or with the large back gear wheel which is keyed to the lathe mandrel. The V-tool is [redacted] used to scribe [redacted] radial line on the face of the work, and this line is continued along the side of the collar; next, the detent is set to engage [redacted] tooth space diametrically opposite to the first and the marking-out operation with the V-tool is repeated.

The collar can now be parted off to length, and, after it has been reversed in the chuck, the back surface is faced.

The length of the recesses to receive the heads of the Allen screws is marked-out from the lines previously scribed on the sides of the collar; that is to say, these are scribed $\frac{3}{16}$ in. from either diameter line. The collar is now clamped on its side in the lathe tool clamp, and packing strips

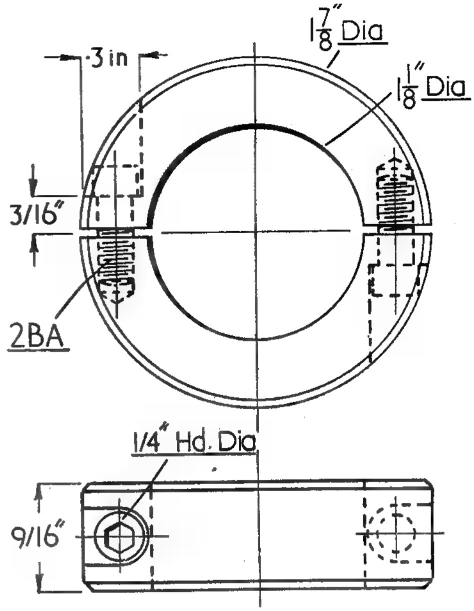
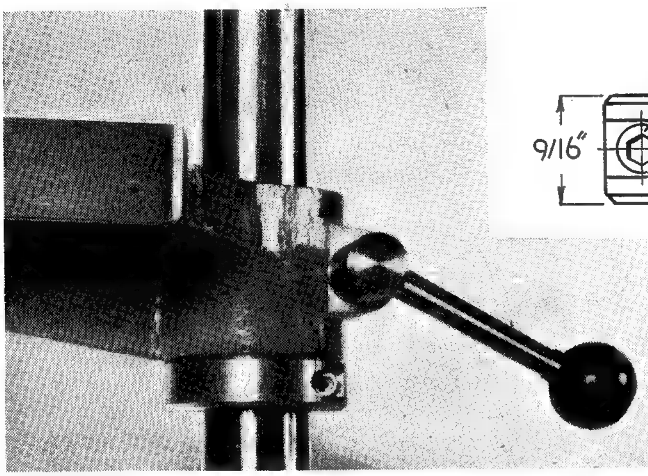


Fig. 4



Left.—Fig. 3. *The table stop in position*

Below.—Fig. 5. *End-milling operation on the stop collar*

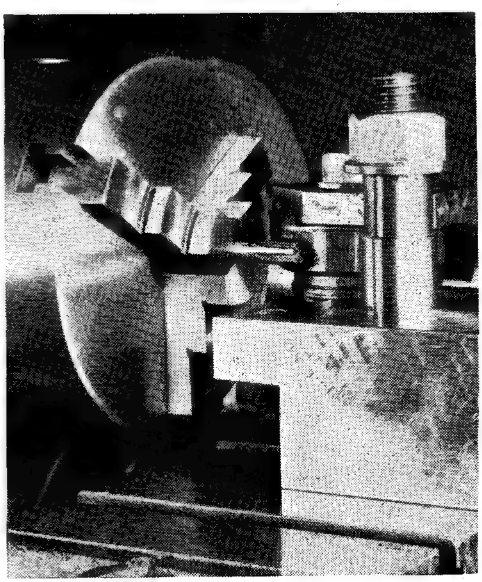
[redacted] inserted to set the centre-line of the collar at lathe centre height.

In addition, the scribed diameter line must be set to lie at right-angles to the lathe axis. This may be done with sufficient accuracy by adjusting the position of the collar until, on measurement with [redacted] rule, either end of the diameter line is found to lie at an equal distance from the face of the chuck.

The method of setting up the work in the lathe is illustrated in Fig. 5, but here a cross-slide toolpost has been used instead of the ordinary top-slide tool holder. The photograph also shows how a $\frac{1}{4}$ in. dia. end-mill is mounted in the chuck for milling out the recesses for the heads of the Allen screws. As shown in Fig. 6, the edge of the end-mill is brought into contact with the line scribed $\frac{3}{16}$ in. from the diameter line, and the reading of the leadscrew index is taken [redacted] a guide for finishing the end of the recess. The cross-slide index is then set to zero.

As will be seen in the drawing, the recess is milled 0.3 in. deep, and the cross-slide feed screw will therefore have to be given three full turns to machine the slot to its full depth, that is to say where the feed screw has [redacted] pitch of 1/10 in.

By taking [redacted] series of cuts in [redacted] radial direction and, at the [redacted] time, working to the readings



given by the indexes of the two feed screws concerned, the machining of the recess can be quickly and accurately carried out. Next, the end-mill is replaced by a centre drill, which is set on the centre-line of the recess by turning the cross-slide feed screw three revolutions inwards from the original zero position of the index.

After the drilling centre has been formed by traversing the saddle to feed the work to the drill, a No. 22 or 5/32-in. dia. tapping size drill is fed in for a distance just short of breaking through the surface of the work; this hole is then enlarged with a No. 13 drill as far as the diameter line in order to provide clearance for the shank of the No. 2-B.A. Allen screw. The depth of drilling can readily be measured by reference to the leadscrew index as the saddle is traversed for the feed.

On completion of the drilling, the collar is rotated for 180 deg. and then reclamped in the toolpost; as before, the diameter line is set correctly from the face of the chuck, and the machining of the second recess is carried out in a similar manner.

At this stage, it is advisable to tap the two screw holes, as the clearing portion of the holes will form a guide for aligning the tap correctly. Although a hand hacksaw may be used for dividing the collar on the scribed diameter line into two equal parts, the work will be done more neatly if a circular slitting saw is employed. For this purpose, the collar is again clamped in the lathe toolpost and a narrow slitting saw, carried on an arbor between the lathe centres, is carefully fed into the work. When sawing in this way, the cross-slide should be adjusted to work rather stiffly so that the saw teeth, on meeting the previously drilled screw holes, do not grab into the work and become broken. In addition, the saw teeth should be kept well lubricated with cutting oil throughout the operation.

When the finished segments of the collar were applied to the drilling machine column, it was found that they would not bed into place, as some slight distortion of the metal had taken place during the machining operations. This was easily corrected by applying blue marking to the

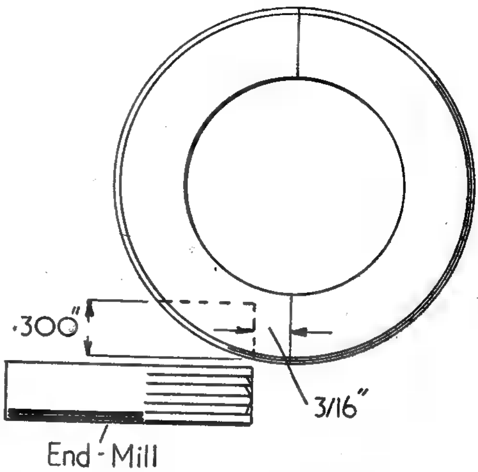


Fig. 6. Data for the end-milling operation

column and then scraping the high spots on the edges of the collar shown up by the blue transfer marks. The diameter of the heads of the Allen screws must be reduced from the standard $\frac{5}{16}$ in. to a few thousandths of an inch under $\frac{1}{4}$ in. to enable them to turn freely in their machined recesses; finally, the shanks of the screws are shortened so that they do not bottom in their threaded holes when the table stop is secured to the column of the drilling machine.

For the Bookshelf

Junior Science, by Stuart Miall. (London: The Caxton Publishing Co. Ltd.). Three volumes, 892 pages, size 7 in. by 10 in. Fully illustrated. Price £4 5s. 6d.

This is a commendable and comprehensive survey of modern science, lucidly written and copiously illustrated. The work is issued in three handsomely bound volumes which, between them, are sub-divided into seven main sections covering: Engineering, Astronomy, Mechanics, Physics, Chemistry, Mathematics and Natural Science.

The text extends to something like 350,000 words; it is not concerned with the history of the subjects, but with the statement of principles and present-day applications of the results of research.

The text is very well supported by the illustrations which consist of five plates in colour, 97 photographic reproductions and 513 diagrams. All have been very carefully chosen or prepared to bring out clearly the particular features illustrated.

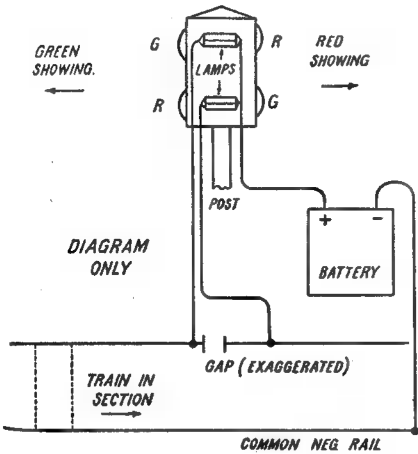
The author's approach to Mathematics is interesting and even entertaining by reason of the clever and mostly amusing, though none the less accurate, methods suggested for solving problems. A "play as you learn" system, involving the use of "magic squares," "puzzle corner" and such devices, is frankly brought into service in order to stimulate interest in a subject that lies at the very root of scientific study.

Although this book is obviously intended as a preliminary guide, or introduction to a very big subject, it makes very good reading and should appeal strongly to anyone at all interested in modern scientific progress.

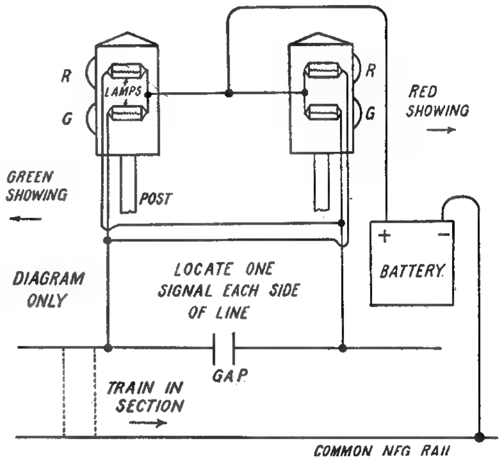
Lobby Chat—More About Signalling

by " L.B.S.C."

ALTHOUGH at time of writing, it is only a few days since my little dissertation [redacted] automatic signalling appeared in these notes, several inquiries have already come to hand regarding the possibility of similar installations [redacted] both back-garden and club lines. Maybe if I enlarge on this subject [redacted] wee bit, it may [redacted] direct correspondence, and be of assistance to our embryo signal engineers. First of all, let [redacted] make it quite clear that I am not, and don't claim to be, any expert in signalling matters; Mr. O. S. Nock is the right party to provide all the information about signals. All I did was to put the little knowledge of full-sized automatic signalling that I learned on the Underground, to practical use in converting the old Coulsdon " peg " to automatic working " for old times sake," and adding a modern touch, for the sake of variety. Those of my few personal friends who have driven over the line, are tickled to death with the outfit, and at least four other little railways will soon be adorned with waving [redacted] and scintillating jewellery.



Double-sided signal for straight line



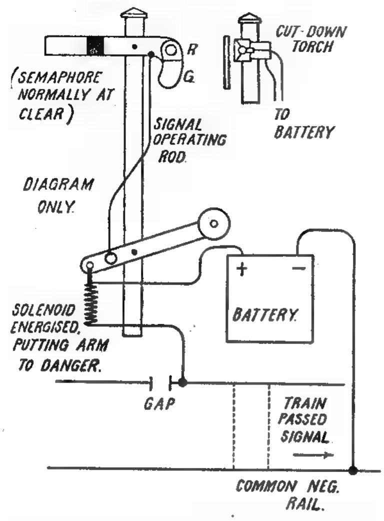
Two single-line signals for straight line

Now [redacted] to the queries: I don't think the Morris indicators [redacted] [redacted] available. Those [redacted] have [redacted] from Gamages years ago, and cost sixpence each; not much for [redacted] aluminium-cased three-aspect colourlight, double-sided, with three 12-volt festoon bulbs in it! A friend purchased them for me, over the counter. Maybe [redacted] readers of this journal may have bought [redacted] few, and had no use for them; they might be willing to sell. However, anybody who [redacted] cut a bit of sheet metal and solder [redacted] simple joint, should have no difficulty in making a small [redacted] of thin sheet brass or copper (necessary for outdoor lines) and fixing three torch reflectors in it. The coloured roundels could be made of cellophane. My fair lady bought [redacted] sweets the other day, wrapped in cellophane of several different colours, including red, yellow, and green, which would have done fine. A combined semaphore and " searchlight " signal could be made by fixing spectacles [redacted] the tail end of the signal arm, and using [redacted] cut-down torch for [redacted] lamp. This would throw [redacted] brilliant beam through the spectacle glasses. The torch battery would, of course, be dispensed with, and the lamp connected to the main circuit, [redacted] as the lamps on my distant signal. I may alter the last-mentioned signal in this way, as the arrangement would be neater than the Morris gadget, and Curly has a passion for neatness! It would still retain the drivers' ideal of a coloured beam of light combined with a semaphore arm.

Simple Wiring

On [redacted] back-garden line where there is only one engine in steam at a time, and the signalling is required purely for effect, or to add [redacted] touch of realism to driving (I instinctively looked at the old Coulsdon signal [redacted] every lap, before it became self-acting!) the installation [redacted] be cut to rockbottom simplicity. All you need is a post about halfway along, carrying [redacted] lamp [redacted] with two bulbs in it, and a red and green roundel each side of each bulb. One rail is divided into two sections, each section being bonded; the other rail is continuously bonded throughout, and connected to the negative of the battery. The positive of the battery is connected to both lamps; the return wire from each lamp is

connected to the section of rail toward which the green roundel faces. When a train is proceeding toward the signal, the current travels across the wheels and axles, completing the circuit, and lighting the lamp which is showing [redacted] "green eye" to the driver. On the other side of the lamp box, the beam is showing through the red



Semaphore signal for single line

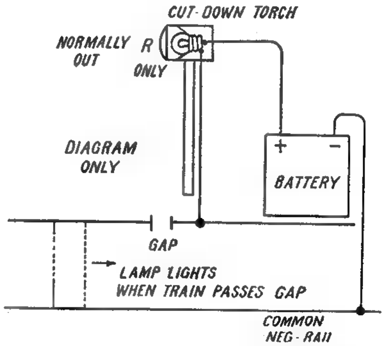
glass, giving warning that [redacted] train is in the other section. When the train passes the signal on to section No. 2, the first lamp goes out, and its mate lights up, showing a red where green was previously displayed, and vice versa, giving the driver the "all clear" for the return trip.

If desired, two separate posts could be used, the lamps showing in the up and down directions, and the lamps wired in parallel, the red on one post and the green on the other, being coupled together, to show the proper aspect in each direction. Semaphores, either upper or lower quadrant, could also be used. The arms should be made from sheet aluminium, with spectacles and [redacted] lamp [redacted] usual. The arm would be operated by a little solenoid, easily home-made, connected to the section of rail past the signal, one end of the winding being connected to the positive of the battery, and the other to the outer rail. As soon [redacted] train passed the signal—which would show normally clear, same as the Underground and other automatically-signalled lines—the wheels and axles would close the circuit, energise the solenoid, and put the signal to danger behind the train. The signals look very quaint, bobbing up and down automatically, and the changing colour-lights have [redacted] kind of fascination of their own. The widow of my late lamented next-door-neighbour friend, who was in the Engineer's Department of the L.B. & S.C. Railway at the [redacted] time that I was in the Locomotive Department, and who afterwards became Transport Superintendent to the District Council, let the upper part of her house to two elderly sisters, also both widows. If I [redacted] running [redacted] engine in the dusk or darkness, the two old ladies will sit by their back window all the time, watching the lights change. I [redacted] fixing up *Annabel's* headlight, and *Grosvenor's* destination lamps, for their special benefit, [redacted] soon [redacted] I can scrape the time.

Safety on Continuous Lines

When a section of [redacted] continuous line is made removable, and the break is out of sight of a train approaching around [redacted] curve, automatic warning is desirable, [redacted] Lt.-Col. Simpson explained [redacted] few weeks ago, when describing his outfit. Also on [redacted] club track, where two or more trains may be running together, [redacted] collision with not-so-good results might take place if one stopped for any purpose, and the following driver had no warning. The rockbottom of simplicity in this case would be to divide the line into sections of sufficient length to enable the heaviest load to pull up in safety, and put [redacted] semaphore at the beginning of each section, controlled from the section ahead, in the same way as described above, for [redacted] semaphore [redacted] a straight line. A distant signal, to repeat the stop signal, could be arranged halfway along each section, wired in parallel with it, exactly the same as my own distant signal. The spectacle on the stop signal would carry red and green roundels; and the distant, yellow and green.

If lights only are required, the simplest way would be to put a red lamp at the beginning of each section, and wire it as shown. The lamp would then be what the railway signalmen call "normally blind," only lighting up when [redacted] train was occupying the section ahead of it. For red and green lights, [redacted] relay would be required, wired up same [redacted] my colourlight signal, the relay being energised and connecting the circuit for the red lamp, when a train was in the section,



One-light signal for continuous track

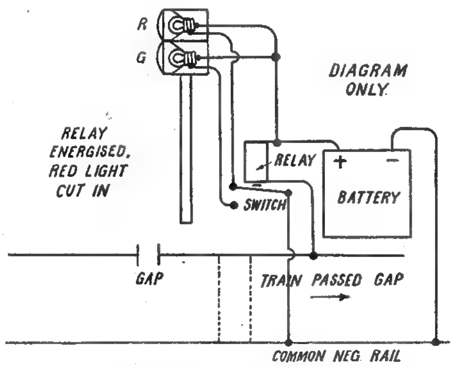
and "dead" when the section was clear, the contact falling, and connecting the green light. A distant, showing yellow and green only, could be placed under the preceding stop signal, thus converting that into a regular three-aspect colour-light.

There are many other variations of signalling which could be applied to a little railway, both for appearance or utility; but I fancy the above

items will clear up the queries raised. My own installation is going well. I have cured the wet sleeper trouble by connecting a low-resistance relay between the rails and the magnetic valve on the Coulsdon signal. Sufficient current leaked through wet sleepers to hold up the valve and keep the signal at danger; but it requires more than leakage current to hold up the relay, so we are now all right. My improvised pressure-controlled compressor switch suffered from burnt contacts through making and breaking too slowly. I thought of replacing it by a regular Westinghouse compressor governor, as used on Milly Amp trains; but when I found that it would cost fifteen guineas, 'nuff sed! At the present moment I am adding a quick-reversing valve to the cylinder of the improvised gadget; and with a quick-break switch in the waterproof casing, I fancy we shall be all set.

Ali Baba's Camel

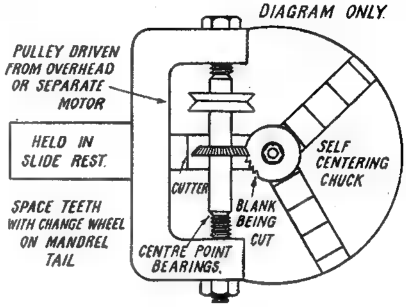
A Sussex reader who is building a *Minx* says that he has seen some of the big sisters carrying two domes; wants to know what is inside the second one, and would it be any advantage to fit the two to the engine he is building. In case any other readers may be puzzled by the second dome on "Ali Baba's camels" as we called them, I'll explain briefly. As most followers of these notes know quite well, the Great Western engines with domeless boilers have top feeds, the water falling from the inlet pipes on to trays which collect some of the impurities. Well, the second dome on the "camel" contained a modification of the same wheeze. When first fitted, it had the tray arrangement inside, and the feed clacks were placed one at each side, so that the feedwater was delivered through the sides of the dome, into the trays. After a period of running, it was found



Two-aspect signal for continuous line

that no material advantage was to be gained by this arrangement; so the whole bag of tricks was taken out, and the feed clacks shifted from the dome, to the usual position on the side of the boiler barrel. To save patching the boiler barrel, the second dome was replaced just "full of emptiness" as the kiddies would say. It does no harm, and provides a little extra steam space. If our friend favours the "camel" appearance, all that is necessary is just a dummy casing.

Some engines have two steam domes connected by either an external or internal pipe, as found in Austria, Czechoslovakia, and other European countries. The idea is that steam taken from two different places in the boiler, is drier than if taken from one place only, and less liable to cause priming. The two open pipes in the top front corners of the Great Western firebox casing, is a variation of the same idea. In case



How to cut true ratchet wheels

any beginners don't know, the extra domes on American and Colonial engines are sandboxes, the sand keeping dry and having a good fall.

It Didn't Click!

Another brother of the locomotive craft has had a spot of bother with a mechanical lubricator; and as I have had the same experience, in common with other readers, maybe I'd better expound. In this particular case, the engine was new; and on its first run, after a little while, there were squeaking sounds from the cylinders, as though they were short of oil. Our friend put it down to initial stiffness, gave the lubricator a few turns by hand, and resumed operations. The engine went fine for a couple of minutes or so, and then again showed signs of distress. The lubricator was taken off, tested, and found absolutely O.K. pumping against 200 lb. pressure; when replaced, the trouble persisted. The builder then started the engine slowly and walked beside it, watching the lubricator; and noticed at once that despite his careful setting of the ratchet gear, to click one tooth per revolution of the driving wheels, the ratchet wheel stopped altogether at one point. As the pawl did not seem to have enough movement, and was slipping back on the tooth of the wheel instead of over-running it, he lengthened the movement by connecting the eccentric rod higher up the ratchet lever. Now, he says, he gets well and truly christened by oil from the chimney, as during a part of the revolution, the lubricator ratchets two teeth instead of one. No amount of adjustment will produce even turning.

The trouble is a badly-cut ratchet wheel with uneven teeth. The old wheels that I used to get in Clerkenwell, before Jerry & Co. put the firm out of business, were properly-cut clock ratchets, with all the teeth exactly even. When the lever

[redacted] set to ratchet [redacted] tooth [redacted] any position of the wheel, it would keep on doing it “ till the [redacted] home,” without missing. The ratchet wheels at present being offered for mechanical lubricators, [redacted] not cut in the [redacted] way, but hobbed, like hobbing [redacted] worm wheel, with this difference : that the diameter of the worm wheel is carefully calculated so that all the teeth [redacted] exactly even, whilst the ratchet blanks [redacted] just slices cut off a rod of standard diameter. The odds [redacted] million dollars to [redacted] pinch of snuff that the diameter will not exactly match the pitch of the hob, and consequently some of the teeth will be unevenly spaced. I have one here at the present minute, with all the teeth except three, at regular spacing ; the three exceptions [redacted] crowded into the normal spacing of two teeth. This one can be utilised by setting the pawl with sufficient stroke to over-run the teeth, and it will not miss ; but at two points in the revolution—when the short teeth come under the moving pawl, and later engage the stationary pawl—it will ratchet two teeth, instead of one. Several of the lubricators on my engines have needed [redacted] bit of jerrywangling to ensure a steady feed without any flooding or starvation.

It costs a little more to produce a wheel with properly cut teeth, than to make one by the hobbing process ; but the superior result is worth the extra, and maybe our advertisers who sell ratchet wheels, will take the hint. It isn't [redacted] very difficult job to cut ratchet wheels on [redacted] ordinary lathe ; [redacted] cutter frame is needed, to fix in the slide-rest tool holder, also [redacted] means of driving the cutter spindle, which can be operated from [redacted] overhead shaft, or [redacted] separate motor. A lathe change-wheel mounted [redacted] the end of the mandrel, would do the needful [redacted] a division-plate ; a “ false tooth ” mounted [redacted] piece of spring steel arranged [redacted] that the tooth fitted between those [redacted] the change-wheel (very old wheeze, this) would serve [redacted] spacer. The wheel blank is mounted on a spindle and held in the three-jaw ; the cutting wheel, a small milling-cutter, is fed into cut with the cross-slide, and traversed past the wheel blank either by moving the top-slide [redacted] the saddle. After each cut, the “ false tooth ” is lifted out of the space between the gear teeth, the mandrel moved around, and the “ false tooth ” dropped into the next space. Once the machine is set up, [redacted] couple of hours' work would produce enough ratchet wheels to last the average locomotive builder the rest [redacted] his life ! Had it not been for the fact that I [redacted] presented with some ratchet wheels by [redacted] esteemed friend, I should long ago have rigged up [redacted] cutter frame, and made for myself, all I would ever be likely to need.

Leeds Does it Again!

The reproduced photograph illustrates [redacted] fine specimen of [redacted] type of engine now practically extinct, though when they first made their appearance around the turn of the century, they were hailed as the “ last word.” All except three had link motion, [redacted] as *Maisie*, the one I described in $3\frac{1}{2}$-in. gauge many moons ago. The one shown, is [redacted] pretty faithful copy, in most respects, of the engine rebuilt in 1938 with Walschaerts gear, the details being taken from a photograph in Mr. O. S. Nock's book [redacted] the locomotives designed by Sir. H. N. Gresley. She is the handiwork of Mr. W. Lynch, one of the founder members of the West Riding Small Locomotive Society. The gauge is 5 in., the “ scale ” being $1\frac{1}{16}$ in. to 1 ft., which is correct for the rail width. The cylinders are $1\frac{3}{4}$ in. bore, $2\frac{1}{4}$ in. stroke ; driving wheels $7\frac{1}{8}$ in. diameter. The boiler barrel is $6\frac{1}{4}$ in. diameter, firebox, etc., in correct proportion, and is fed by [redacted] pump. All the usual blobs and gadgets are included, as [redacted] be [redacted] in the picture, and she has [redacted] mechanical lubricator. The tender is of the later L.N.E.R. straight-side type, as this was preferred to the old G.N.R. pattern with flared coping and coal rails ; the latter soon lose their pristine

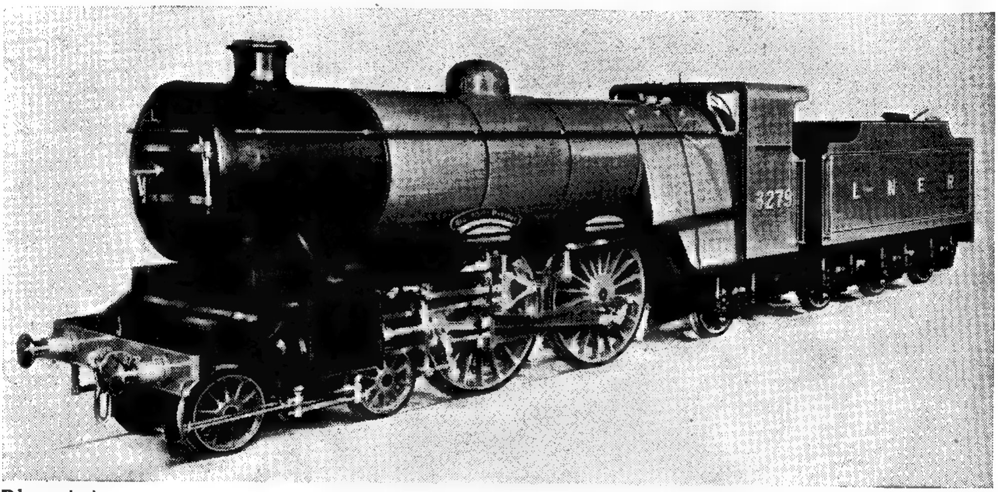
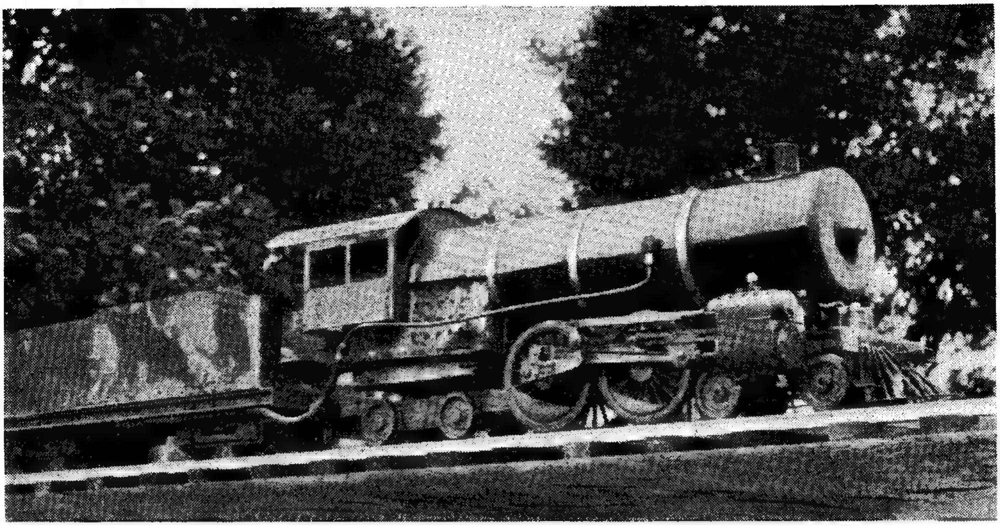
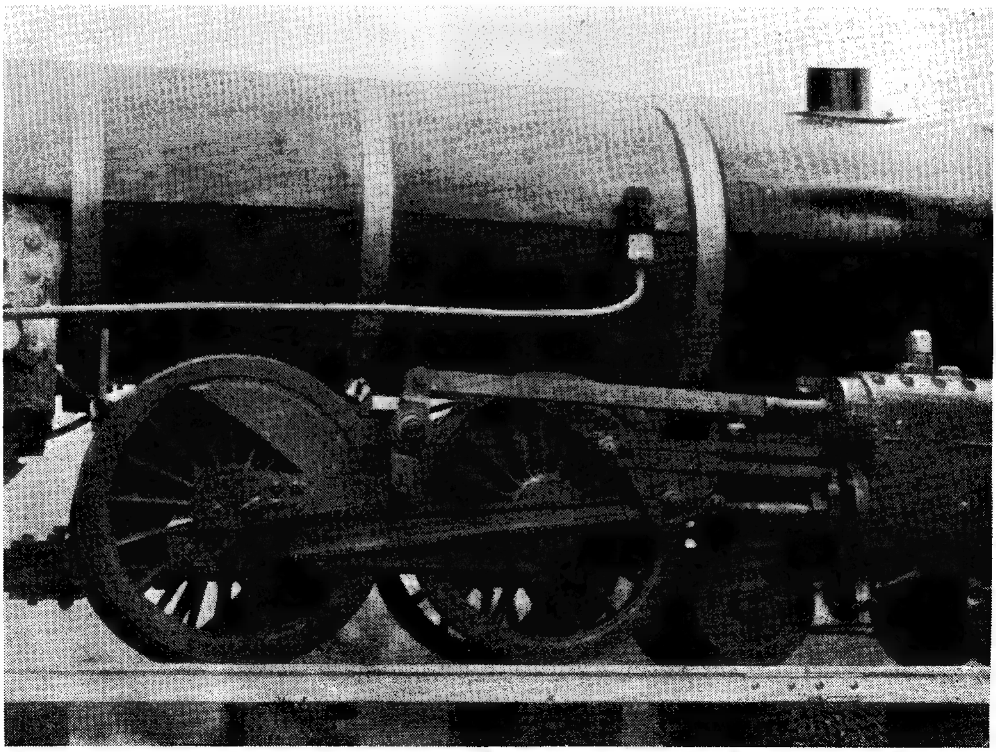


Photo by] [*Overend Press Agency*

A 5-in. gauge version of L.N.E.R. 4-4-2 engine No. 3279, built by Mr. W. Lynch, of Leeds



An unusual job by Mr. K. Friedrich



The loose eccentric gear on Mr. K. Friedrich's engine

beauty when the engine is intended for real work, and become battered and twisted. The engine is very fast and powerful, and has the characteristic roll of her big sisters; friend Lynch says it is quite alarming until you get used to it. Incidentally, my little *Ayesha* does exactly the same, [redacted] speeds equal to 70 m.p.h. and over; it is apparently a wonder how she stops on the road, but [redacted] far she has not had any derailment due to high speed, during her 29 years of hard work. The flexible springing, which is partly the cause of her rolling, is also the reason that she holds the road. American engines [redacted] the lasses to roll and pitch; they would scare the pants off the average British driver and fireman!

The painting, lining and lettering are all friend Lynch's [redacted] work; he says it takes [redacted] long time, but is a job he likes, and judging by the picture, he is certainly a nobby hand with [redacted] brush. Personally, I don't care for painting; our friend speaks truth when he says it takes time, and that is why my poor *Grosvenor* still remains "naked and unashamed [redacted] except for a preliminary priming coat over her boiler. Mr. Ted Taylor, another founder member of the W.R.S.L.S. has built [redacted] exactly similar engine, and both of them are real good workers. At the present time they are building 5-in. gauge *Green Arrows*; friend Lynch's is nearly done, [redacted] time of writing, and [redacted] test on the club track at Blackgates, ran away with [redacted] load of seventeen passengers, with the gear notched up to 20 per cent. cut-off. Congratulations—that's the stuff to give 'em!

A Novelty in Valve Gears

Some folk reckon that loose-eccentric valve gear cannot be fitted to [redacted] outside cylinder engine, especially of American type; but it can, [redacted] the reproduced photographs will show. The engine [redacted] built by Mr. Karl Friedrich, of Pittsburgh, and is [redacted] $3\frac{1}{2}$-in. gauge 4-4-4 with cylinders $1\frac{3}{8}$ in. $\times$ $1\frac{3}{4}$ in., 5-in. coupled wheels, and [redacted] 5-in. boiler containing 29 tubes of $\frac{3}{8}$ in. diameter. She has no superheater, but [redacted] big grate measuring $4\frac{3}{4}$ in. wide, and $8\frac{1}{2}$ in. long. Our friend says in jocular vein, that he is too lazy to write or do much—but there are two ways of looking at that! Granted that the engine is [redacted] simple job; but she works well, and is the result of many hours' labour, so Bro. Karl can't be quite as idle [redacted] he would have us believe. He hopes to finish her off during the coming winter. Anyway, the engine deserves a niche in small locomotive history, for she is the first American-type locomotive that has come to my notice, with an outside loose-eccentric valve-gear, although I know of several old-timers, copies of link-motion engines, with inside loose eccentrics.

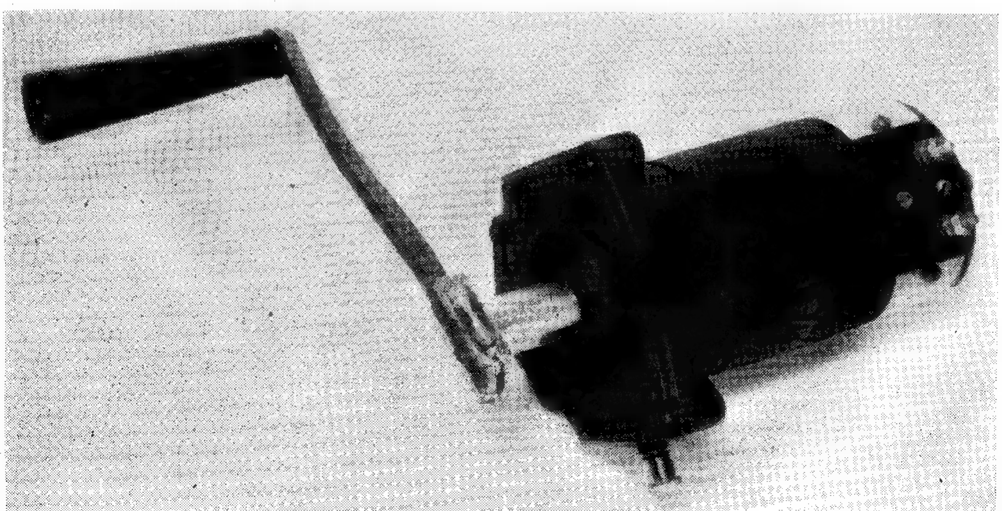
A 5-amp Battery Booster Charger

Our illustration shows [redacted] useful hand-operated generator (ex-paratroopers' equipment) [redacted] number of which are being sold at 30s. each by Bellanger Bros. (London) Ltd., 306, Holloway Road, London, N.7.

Rated at 6 V, 5 A output at 100 r.p.m., the unit can be made to perform [redacted] number of duties, from charging 2-volt wireless accumulators to boosting 12-volt car batteries.

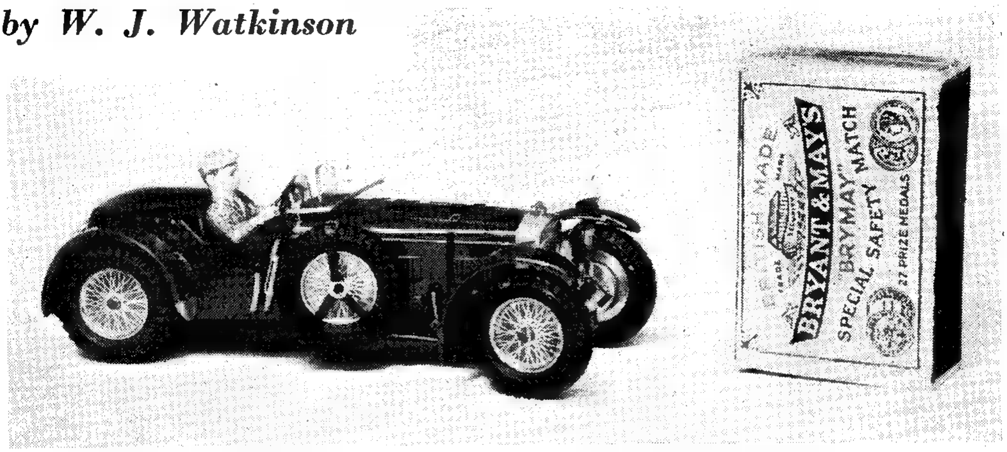
The "winder" handle is easily removable and alternative drives may be affixed to the shaft. The measurements are 7 in. long $\times$ 3 in. dia. and the weight complete in carton is 7 lb.

For further details, apply to the above address.



A Frazer-Nash T.T. Replica Sports Car

by W. J. Watkinson



THIS 1/32 scale model is based on plans published by Percival Marshall & Co. Ltd., and data kindly supplied by Messrs. A.F.N., of Isleworth. The making occupied about two months of spare time, and, apart from the turned brake drums and headlamps, was done entirely with simple tools.

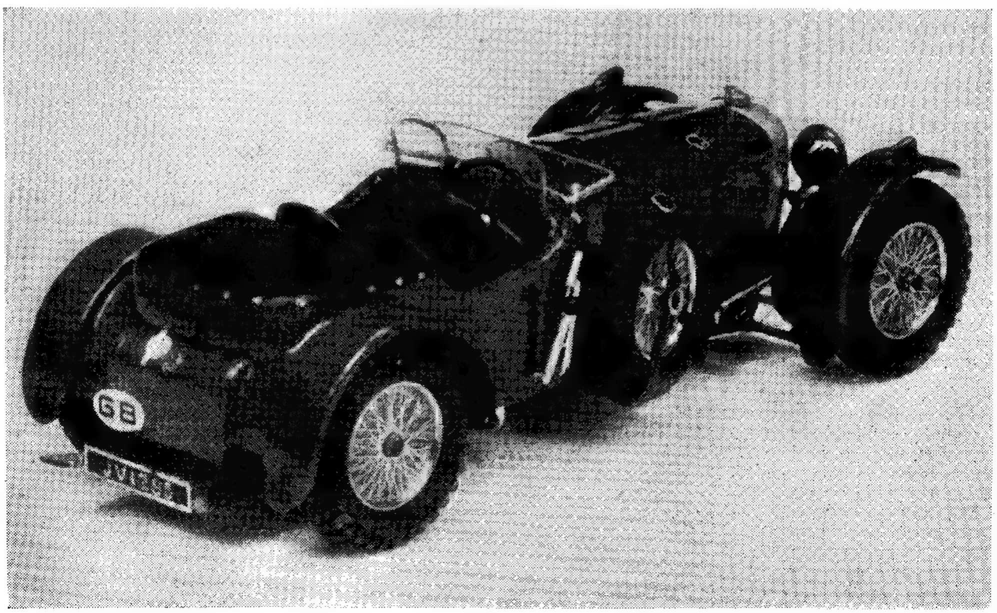
The chassis is made from brass and has correct suspension by means of dummy leaf-springs filed from the solid. The working steering is operated by means of drop arm and drag link, as on the original car. The power unit is a 6-volt Electrotor, driving by belt and pulley on the [redacted] axle.

Bodywork is of wood and paper laminations, finished in dark green cellulose. A dummy suit case on the passenger's seat covers the driving belt.

Dimension are [redacted] follows :—

Overall length, $4\frac{1}{2}$ in. ; Track : front, $1\frac{5}{8}$ in., rear $1\frac{7}{16}$ in. ; Wheelbase, $3\frac{1}{4}$ in. ; Overall height, $1\frac{7}{16}$ in.

Running around [redacted] central pole, the model is capable of [redacted] speed of slightly over 6 m.p.h.



IN THE WORKSHOP

by "Duplex"

No. 71.—*A Small Power-driven Hacksaw Machine

THE complete machine together with its driving motor is shown in the photographs mounted [redacted] oak baseboard, but, if the hacksaw is to be driven from [redacted] lineshaft, this base can be dispensed with, and the machine is then secured directly to the bench top by [redacted] of the bracket feet attached to either end of the steel baseplate. The baseboard used is 1 in. thick, 7 in. wide, and 24 in. long. The width is correct for the standard 1/6 h.p. capacitor-start Hoover motor

The V-Belt Drive

This provides [redacted] reduction ratio of 4 to 1 and comprises [redacted] a driving pulley of $1\frac{3}{4}$ in. pitch diameter, [redacted] Fenner $\frac{3}{8}$ in. M-section V-belt, No. 2300, and [redacted] standard Fenner 7 in. pitch diameter steel pulley, [redacted] arrangement which gives [redacted] distance between the shaft centres of approximately $7\frac{1}{2}$ in.

The driving pulley illustrated in Fig. 4 [redacted] turned from [redacted] iron casting, and is secured to the motor shaft by [redacted] single $\frac{1}{4}$ in. B.S.F. Allen

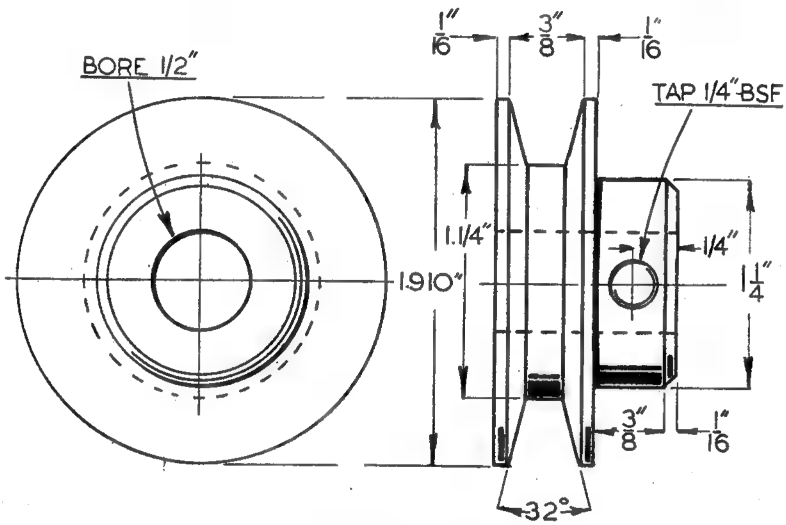


Fig. 4. The motor driving pulley

fitted, and allows the belt line to fall $\frac{3}{8}$ in. beyond the edge of the board, but if [redacted] larger motor is used the width of the board will have to be correspondingly increased. The footplate of the motor is clamped to the board by [redacted] of four $1\frac{1}{2}$ in. × $\frac{1}{4}$ in. B.S.F. bolts passing right through the wood. The edge of the footplate should be about $\frac{1}{2}$ in. from the end of the board when the bolts are in the middle of the footplate slots, in order to allow for adjustment of the belt tension. The base stands on four rubber door stops 1 in. in height; this provides a resilient mounting and allows space for the electrical fittings attached to the under side of the baseboard. One pair of stops should be fitted directly under the motor, and the other pair some 5 in. from the right-hand end of the board in order to distribute the load evenly.

set-screw. Cast-iron is undoubtedly the most satisfactory material for making small V-pulleys, and is far superior to any kind of soft alloy in resisting wear.

The large V-pulley revolves on a short, fixed countershaft carried in a casting mounted on the baseplate.

The general arrangement of this drive, together with the geared drive to the crankshaft, is illustrated in Fig. 5, where it will be [redacted] that the small gear pinion is attached to the V-pulley and both are mounted [redacted] one end of the base bracket casting; the other end of this casting serves to carry the vertical [redacted] to which the saw beam is pivoted.

The dimensions of the cast-iron bushing [redacted] which the pulley and the pinion are mounted [redacted] given in Fig. 6. The pulley is secured by a $\frac{1}{4}$-in. B.S.F. Allen set-screw, and the pinion is attached to the shoulder [redacted] the bushing by means of [redacted] pressure plate and four 6-B.A. screws,

*Continued from page 272, "M.E.," August 24, 1950.

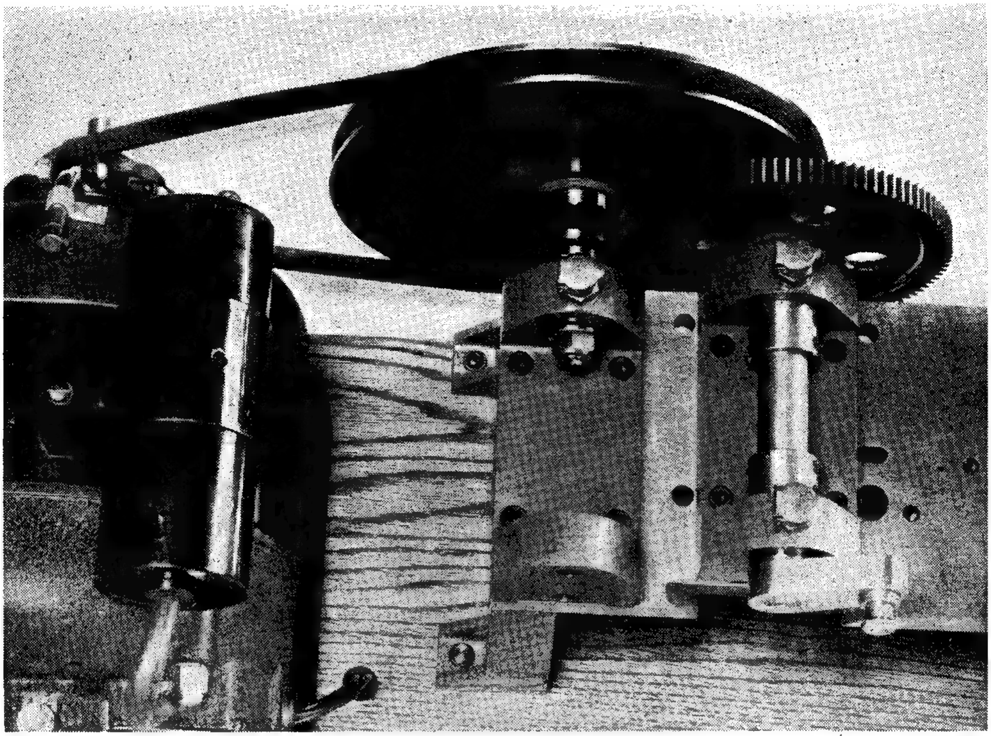


Fig. 5. The two-stage drive to the crankshaft

The bushing is chambered, as represented in the drawing, to form an oil-well for maintaining the lubrication of the bearing. After the bore has been machined, it is finally lapped to size to remove all tool marks and to ensure that it is true and parallel. As it is essential that both wheel mountings should be concentric with the bore, it is advisable to finish the wheel seats to size with the bushing mounted on a true-running mandrel.

It will be seen both in the photograph in Fig. 7 and in the working drawing in Fig. 8 that the

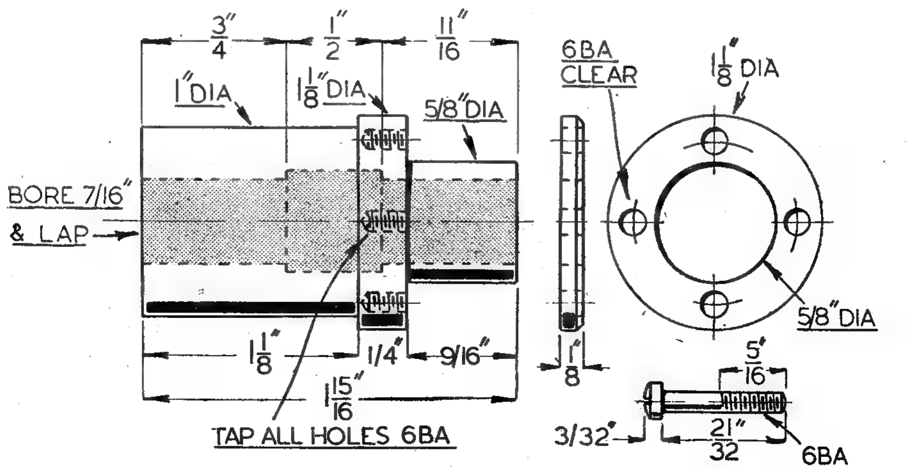


Fig. 6. Bushing to carry the gear pinion and the large V-pulley

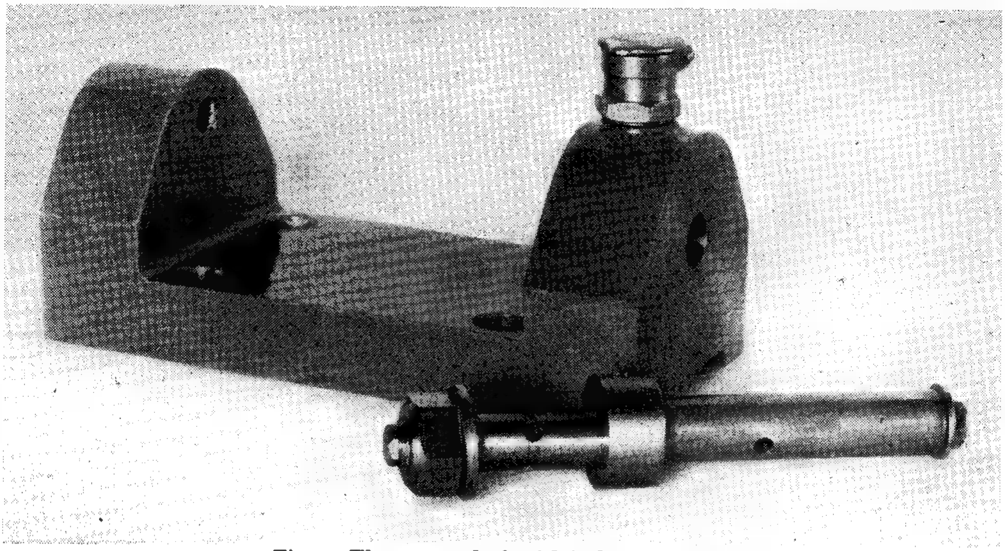


Fig. 7. The countershaft with its bracket casting

bearing portion of the pulley-shaft, or countershaft, is machined eccentric to the part which is secured in the casting; this allows the depth of meshing of the gear wheel teeth to be accurately adjusted by rotating the shaft with [redacted] small tommy bar. The eccentric machining is carried out by interposing a packing strip between the work and one jaw of the self-centring chuck, or the four-jaw chuck [redacted] be set to give the required eccentricity, which is then measured with the test indicator. The oil-ways from the spring-lid lubricator fitted to the casting and leading to the oil-well formed in the bushing are drilled [redacted] shown in the drawing, but [redacted] leather washer should be fitted to the shaft under the securing nut in order to form [redacted] oil seal at this end of the shaft. The end of the oil-way is closed with a 4-B.A. screw.

After it has been turned some half [redacted] thousandth of an inch oversize, the shaft is finally lapped to [redacted] close running fit in the cast-iron bushing.

The Countershaft Bracket Casting. Fig. 9

The base of the casting is first filed or machined flat to form [redacted] datum surface, from which the centre of the bore to receive the pivot shaft is marked-out and then deeply centre drilled. The casting is then mounted on an angle-plate attached to the lathe faceplate to enable the end face to be machined and the shaft bore to be drilled and finally bored to size. Following this, the side faces of the casting [redacted] machined truly at right-angles to the machined end face, and the other end is also faced in like manner.

These facing operations can, of course, be carried out conveniently in a shaping machine, or even filing may have to be resorted to should there be difficulty in mounting the work.

In actual practice, however, it was found that the casting could readily be mounted in [redacted] Keat's V angle-plate attached to the lathe faceplate, [redacted] illustrated in Fig. 10. The base of the casting [redacted] now be marked-out, drilled, and counter-

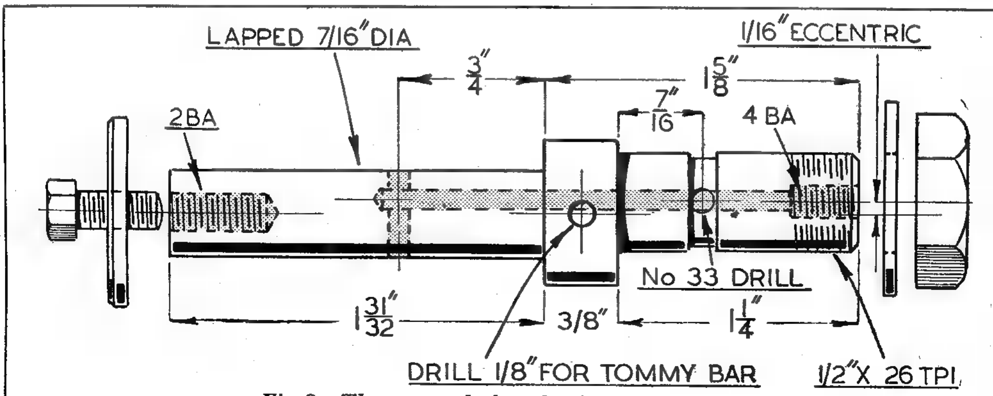


Fig. 8. The countershaft: showing the oil ways

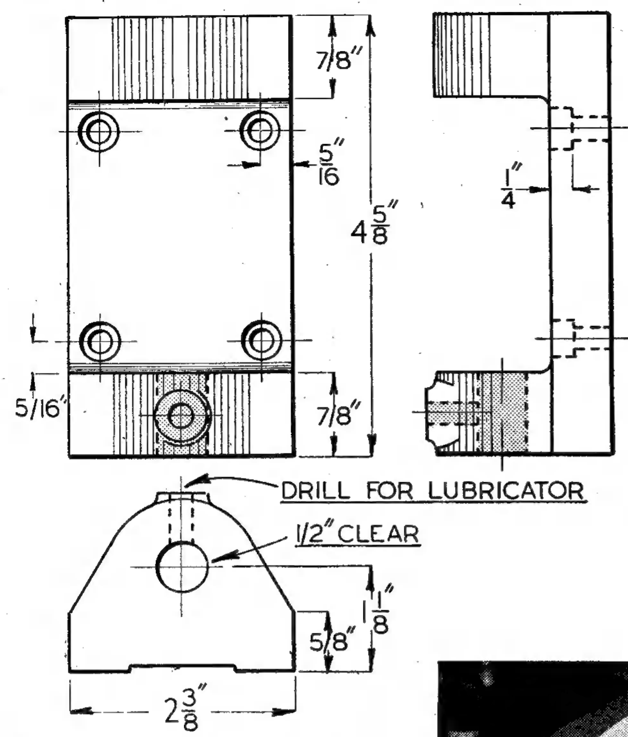


Fig. 9. The countershaft bracket casting

drilled to form the bolt holes for the Allen screws which secure the part to the baseplate. The centre-lines on both ends of the casting should next be marked out conspicuously, as they will be required later both for locating the crankshaft bracket and for drilling the bolt holes for securing the beam pivot-arm. Finally, the inner face of the casting is machined or filed in order to provide a flat bolting face for the nut securing the pivot shaft.

The Baseplate

This consists of a length of flat mild-steel 12½ in. long, 5 in. wide and ½ in. thick. The upper surface must first be filed flat to provide a true seating for the three castings which are here mounted. At the same time, the front edge of the material is filed straight and square, as it will be used later as a datum surface for locating the three castings.

The countershaft bracket casting can now be mounted on the baseplate with its left-hand edge level with the end of the plate and its front face overhanging the plate by 1/32 in.

The casting is correctly aligned at right-angles to the front edge of the baseplate with the aid of a try-square applied to the machined side face of the casting. After the casting has been firmly secured in this position with a pair of toolmakers' clamps, a drill fitting the bolting holes is entered for a short distance, and this is followed by the No. 3 tapping size drill.

If the baseplate is then tapped while the casting remains in position, it will be found that the clearance holes previously drilled will serve to maintain the tap upright. The holes for the screws used to attach the leg castings to the baseplate are now drilled and tapped as represented in Fig. 11.

Next, the aluminium castings, Fig. 12, which form the legs supporting the baseplate are drilled for the attachment screws, and, in addition, the feet are drilled with a No. 16 drill to take the No. 8 wood-screws used to secure the castings to the baseboard. It should be noted, however, that, instead of a wood-screw, a 2-B.A. bolt is fitted at the front of the left-hand leg casting to form an

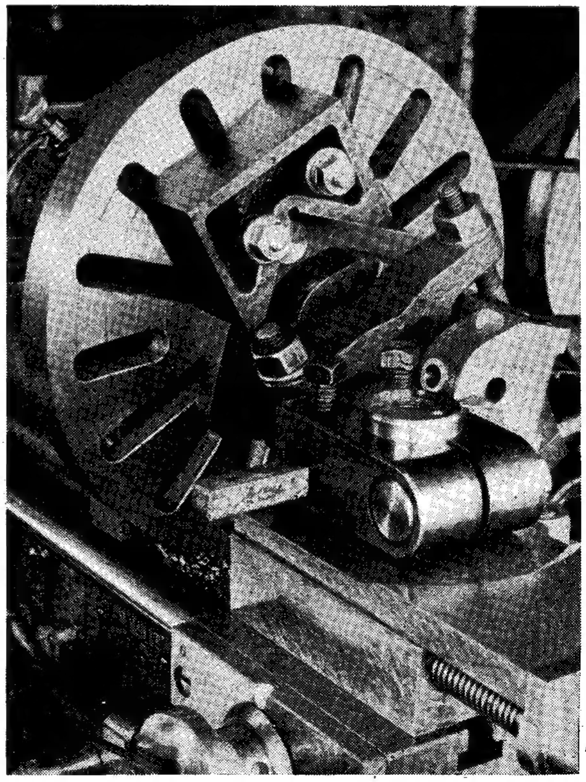


Fig. 10. Machining the bracket casting mounted in a Keats V-angle plate

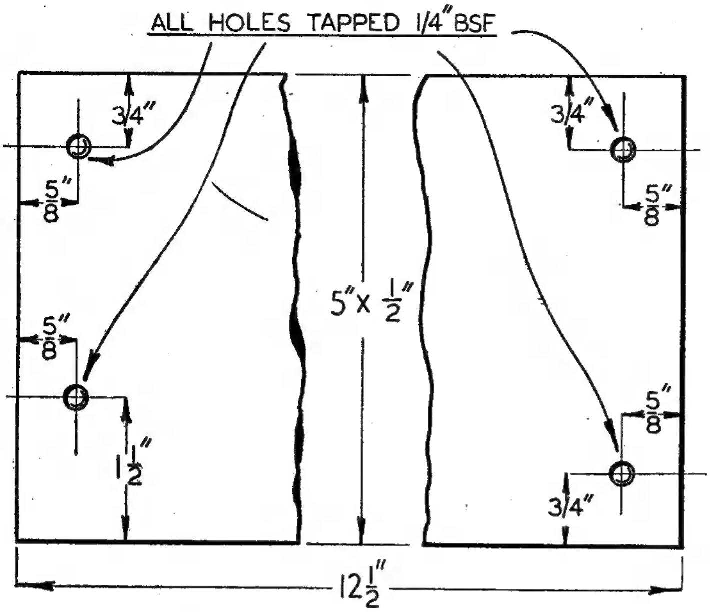


Fig. 11. Location of screw holes for attaching the leg castings

earth connection for the electrical equipment. When the baseplate has been secured to its legs, the assembly can be mounted on the baseboard, and its position determined by setting the two belt pulleys in line with the aid of a straight-edge or a length of cord; at the same time, the centre distance between the two pulleys is set to $7\frac{1}{2}$ in., with the motor fixed at the mid-point of its adjustment travel. Those who are eager to see some part of the machine working can now fit the belt and start the motor to set the first stage of the drive in motion.

(*To be continued*)

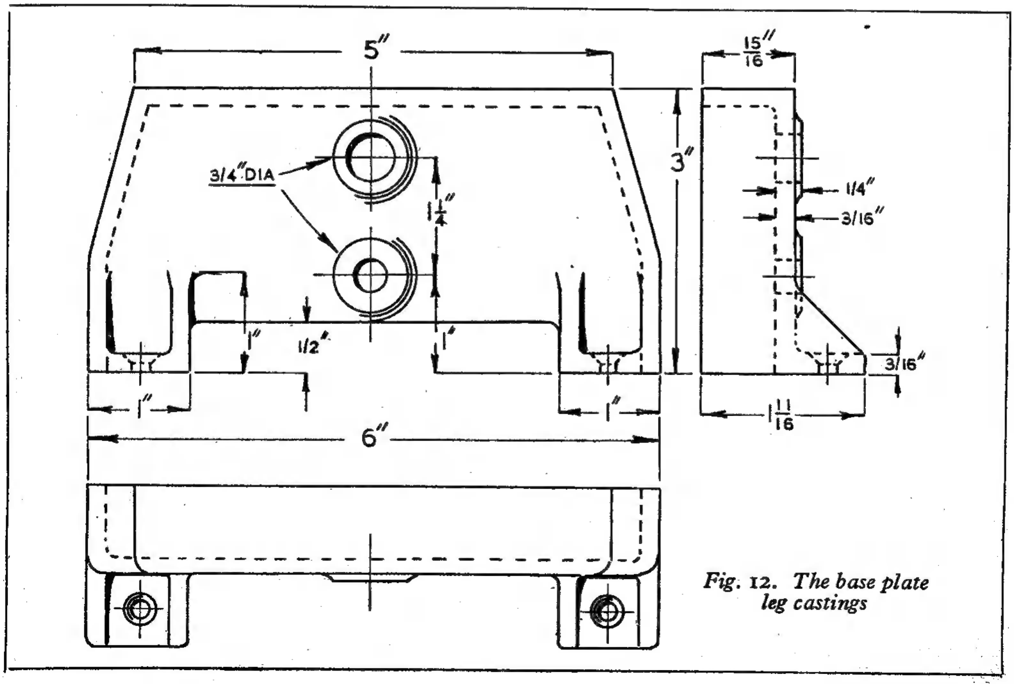
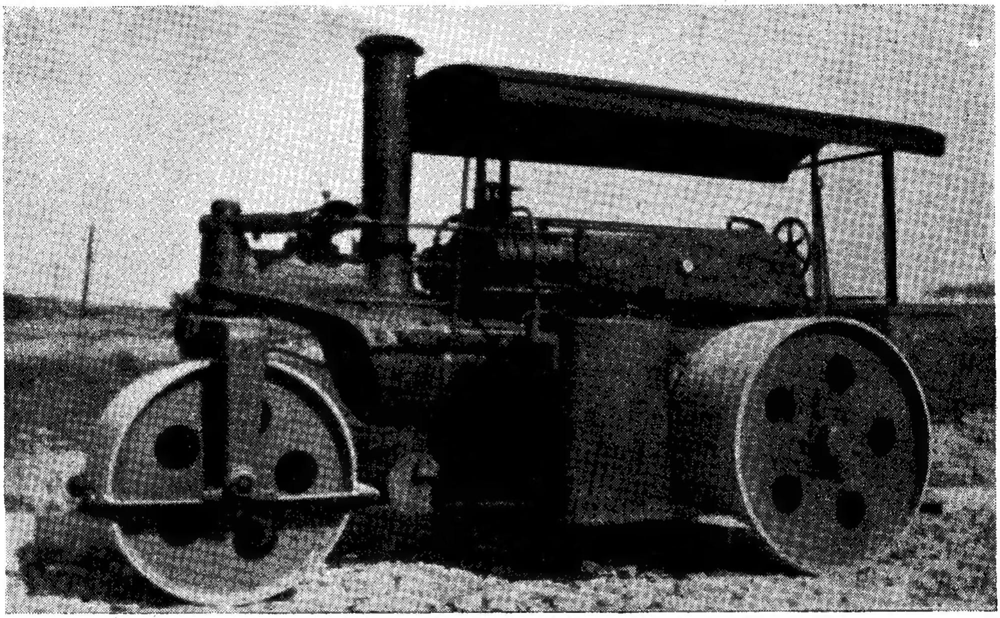


Fig. 12. The base plate leg castings

PRACTICAL LETTERS

Tiller Steering

DEAR SIR,—In a recent issue of THE MODEL ENGINEER several letters were published, including an extract from one of mine, referring to the Robey Roller, the photograph of which you published. In one of these letters, namely, from Mr. Hughes, of Sheffield, he remarks about the tiller steering being somewhat unusual. This is not so and was adopted by other makers. The



photograph reproduced herewith is of a further example of this type of steering, a Wallis & Stevens 8-ton Advance Roller which I was driving about three weeks ago. I hope this will be of further interest to your readers.

Yours faithfully,
Liversedge. J. A. SMITH.

Any Ideas ?

DEAR SIR,—I am employed at the local R.E.M.E. workshops, and it is time now to think about the children's Christmas party.

Some three years ago we made up a huge dragon and mounted it on a Lister one-ton platform truck. We towed a rubber-tyred fancy trolley illuminated from a tank battery to carry a dozen youngsters. This outfit must have carried thousands of kids, not only round our workshops, but it has been loaned to other units for their parties.

Three years is a long time to run the same amusement, so we are looking round for another source of child-carrying outfit : at the moment a roundabout is in the air. Can you or your readers give us any other ideas that we can get working on ?

Are there any books or drawings we could buy on amusement park machinery ?

I have contacted several of my fellow-workers on roundabout construction, but am unable to get much information of definite use. What I am after is method of drive, diameter of base, height, gearing necessary, rise and fall of lifting cranks, how the horses are constructed and numerous other details.

I should esteem it a favour if you could help us with our problem, as our old dragon is getting the worse for wear, and a little stale. You can imagine the kids' talk when they see it at our next Christmas party, " We had that last year, and the year before," so any information will be welcome.

Yours faithfully,
Warminster. S. FORD.

(*If any of our readers have suggestions to make, we are sure our correspondent would be grateful. His address is : Kia-ora, Victoria Road, Warminster, Wilts.*—ED., " M.E.")

Model Race Cars

DEAR SIR,—In reply to the enquiry *re* what is the interest in model race cars. The answer is simple : The publicity given to this branch should be in proportion to the number of exhibits at this year's " M.E." Exhibition. Result : Half a page, once a month !

Yours faithfully,
Wembley. C. R. JEFFRIES.

"The Point of View"

DEAR SIR,—That old optical illusion of six cubes that change to seven while you look at them has found a cousin on page 159 of the July 27th issue of THE MODEL ENGINEER.

Fig. 6—"Tool for machining spigot on mandrel"—can also appear as a much-worn step with skirting board alongside.

Possibly other readers have noticed the illusion.

Yours faithfully,
Birmingham, 21. B. JEFFERIES.

Windmills

DEAR SIR,—I wish to draw the attention of those readers of THE MODEL ENGINEER who are interested in the history and construction of windmills, to an article entitled: "A Propos du Mulin de Valmy," in the April, 1948, issue of *Revue du Bois*, Volume 3, No. 4, published at 40, Rue du Colisee, Paris, 8.

It is a subject of which I know nothing, but struck by the clarity of drawings and text, thought it would be of interest to some of your readers.

Yours faithfully,
JOHN HOUSTOUN,
Portugal. M.I.Mar.E.

More Steam

DEAR SIR,—I quite agree with the comments of your correspondent, W. Jenkins, in THE MODEL ENGINEER of August 3rd.

To me the space devoted to articles on steam engineering appears very small to that devoted to i.c. engineering in one form or another.

I feel sure that articles written on the lines of those of "L.B.S.C." (which I always read with interest although not a locomotive enthusiast), dealing with hulls and machinery of prototype marine models, would be much appreciated by many readers.

Yours faithfully,
Exmouth. A.D.S.

CLUB ANNOUNCEMENTS

Tonbridge Model Engineering Society

The annual general meeting was held on August 17th, and the following officers were elected for the coming year. President, Mr. C. C. Langer; chairman, Mr. H. H. Mills, vice-chairman, Mr. J. P. Mercer; secretary, Mr. R. H. Procter; assistant secretary, Mr. E. M. Graville.

A report of the events of the past year was given by the secretary, and there was then a general discussion on the erection of the new track in the lower playing field of the Castle grounds. Finance was, perhaps, the chief problem, but there were many suggestions that seemed very helpful.

Hon. Secretary: R. H. PROCTER, Roslyn, Coldharbour Lane, Hildenborough.

Exmouth and District Model Club

The recent exhibition held at the Y.M.C.A., Victoria Road, Exmouth, was well attended, among the attractions were two working model railways in 4- and 7-mm. scale and a control-line racing car.

Notable models were a 0-6-0 L.M.S. locomotive and train of goods wagons made by Captain M. A. Gibbert, R.M., in 4-mm. scale; some very well made ships in bottles by Mr. R. Rooney, and control-line aircraft of their own design by Messrs. E. V. Allen, A. E. Chappell and S. L. Pinniger. Mr. S. E. Kerswell showed a stationary steam engine, worked by compressed air. Mr. R. D. N. Salisbury showed a G.W.R. six-wheel clerestory-roof coach with full interior fittings in 7-mm. scale.

We welcome any modellers in the district to join our club.

Hon. Secretary: R. D. N. SALISBURY, 32, Chapel Street, Exmouth.

Ickenham and District Society of Model Engineers

The society continues to flourish and one member has been successful in getting a coveted Bronze Medal awarded at the recent "M.E." Exhibition. The "OO" gauge section are going ahead with an exhibition layout and, as is usual in the society, all members are being pressed into service.

Many useful additions have been made to the society library.

Prospective members should call or write to the Hon. Secretary, A. F. DUNN, 27, Ivyhouse Road, Ickenham, Uxbridge. Tel.: Ruislip 3518.

Glasgow Society of Model Engineers

On September 16th the annual general meeting will be held at 60, Clarendon Street, Glasgow, N.W., at 7.30 p.m.

Particulars of membership can be had from the address below.

Secretary: JOHN W. SMITH, 785, Dumbarton Road, Glasgow, W.1.

The Kingsmere Model Power Boat Club

The first annual M.P.B.A. regatta of the above club will be held on Sunday, September 17th, at the Kingsmere, Wimbledon Common, commencing at 11 a.m. Events will be run in the following order:—

500 yd. race for "A" class hydroplanes.
300 yd. race for "C" class (restricted) hydroplanes.
300 yd. race for "C" class hydroplanes.
300 yd. race for "B" class hydroplanes.
300 yd. race for "D" class hydroplanes.
Steering competition.
Towing race.

Hon. Secretary: C. F. MORGAN, 134, Lavenham Road, Southfields, S.W.18.

City of Bradford Society of Model and Experimental Engineers

Our programme for September and October is as follows:—

Thursday, September 7th. Visit from members of the Keighley society.

Thursday, September 21st. Talk by Mr. Moulson on a boat he has recently completed.

Thursday, October 5th. Private exhibition for members and friends.

Thursday, October 19th. Talk by Mr. Hainsworth—"Gauge 'O'."

We would like to make the visit of the Keighley society as interesting for them as possible. As many members as possible are requested to bring something along to show them.

The private exhibition on October 5th for members and friends should be a real social evening. It will be held in our usual meeting room. After a considerable amount of discussion, it has been decided not to make this a competitive event, and there will be no prizes.

In an endeavour to attract new members, Messrs. J. W. Meeson & Son have kindly consented to allow us the use of one of their windows for a display of models.

Hon. Secretary: E. HAMMOND, 83, Norman Avenue, Eccleshill, Bradford.

Huddersfield Society of Model Engineers

On Sunday, September 10th, the Birmingham Society, who have a large track, are holding a rally. It is proposed to run a coach to Birmingham on that day if sufficient of our members are interested: also, any members wishing to take a locomotive in the coach may do so. Coach will leave the workshop at 7 a.m.

On Tuesday, September 19th, a visit will be paid to the works of the Gledhill Brook Time Recorders Limited, Halifax, to see the maintenance of mechanical and electrical time recorders. 6.30 p.m.

Secretary: F. W. L. BOTTOMLEY, 763, Manchester Road, Huddersfield.